the fact, when the limited express or the ocean greyhound speeds us from ocean to ocean or from land to land, that those whose labor supplies the energy by which we are able to seek health or wealth or happiness in other climes, trudge from home to mine and from mine to home, year in and year out, too poor to avail themselves of the facilities their toil has supplied; that they work below ground, scarcely seeing even the daylight beauties of the home neighborhood, with no opportunity to grasp the means of culture and refinement brought to our very doors from the old and new world through their patient efforts.

If the great, sympathetic American public could see for itself, could know as I know the sorrows and the heartaches of those who spend their lives in the coal mines of our country, I am sure that they would give their unqualified support to every effort which is being made by the organizations of labor to ameliorate the conditions under which these men work, and to secure for them wages commensurate with their hazardous employment; thus enabling them to take the little boys from the breakers and mines and place them, for a few years at least, in our schools, where they properly belong, and where they may receive their birthright of education and enjoy the sunlight so needful to their physical development. To make this great movement a success we are bending our every effort, and we look with confidence to the American people for sympathy and support, for we are firm in the belief that any action which raises the standard of our citizenship confers upon our country a measureless blessing, the benefits of which will be increasingly apparent as the years go by.

A PRACTICAL VIEW OF AMERICAN MACHINE SHOP CONDITIONS.

BY M. COKELY.

M. Cokely has for eleven years been engaged in systemizing and organizing the work of various American shops with a view to determining costs, stopping leaks, reducing expenses, and increasing output. He was engaged as inspector with the Edison company, and as superintendent under the receiver of the Mather Electric company; was with the Jeffrey Mfg. Co., Columbus, Ohio, introducing piecework and other advanced systems; with the Falls Rivet and Machine Co. during reorganization; with Clark Bros., as superintendent; with the C. W. Hunt Co., the Payne Engine Co., the Chicago Malleable Castings Co., and the Plano Mfg. Co., as expert and superintendent. He has made economical production a study, and has an intimate acquaintance with the practical work of the shop.

In considering the relations which should exist between employer and employee in industrial establishments, it is necessary to take into account their records and surroundings and the influence these exercise on character. The energy which the American workman has exhibited has not been equaled in any other part of the globe. This is true not only of the native born but also of the naturalized foreigner. The latter soon becomes imbued with that all pervading spirit of activity which is a recognized national American characteristic. How that spirit originated I am not prepared to explain. It may be due to race intermixture, to political or climatic conditions, or to all three; but this is positive—that the commingled races of people who have made the United States famous have emigrated to pretty much every other quarter of the earth but in no place have they developed the same characteristics or produced the same results as they have within the boundaries of the United States. Suffice it to say that this peculiarity exists and that it is nurtured by the influence of example. It is a fact that the workman has been educated to a realization of the necessity of comfort and luxury. He is a witness of it and in touch with it nearly every hour of his life. In the mansion of his next door neighbor, in the streets and in the conveyances that traverse them, he is side by side with it. As he

travels through the country he sits in the midst of it, and throughout his whole existence affluence is constantly before his eyes. He sees the man with whom, perhaps, years before, he labored side by side as a workman, now in the possession of wealth and honor. He sees no barriers to the possession of wealth and position except those due to his own natural defects. There is no class distinction in America so clearly defined as to limit his ambition or efforts. Say what one may, there is a civilizing influence in luxury, judiciously enjoyed. The example has been set for him. On the record sheet of human ambition and honorable success he may place his mark at a point equal to the highest ever reached by man. The record sheet from that exalted point down to the bottom is covered by marks, clear and distinct, of varying degrees of success according to the ambition or ability of the individual or the circumstances under which he labored. That is the record of the American workingman. Amid such surroundings and with such incentives his heart must be imbued with a spirit which lifts him above the plane of a mere servant or that of the workman as it is understood in Europe. The position which has been productive of such results cannot be otherwise than dignified, and to maintain that dignity he must receive sufficient remuneration for his labor. In describing the record of the workman we have practically described that of his employer, the manufacturer, because the majority of the manufacturers are nothing more or less than successful American workingmen—men in whom that spirit of activity was intensified to such a degree that they became the employer instead of the employed. While, as a bedrock principle, the workman on account of his record is entitled to the highest remuneration for his service, the manufacturer is entitled to the highest possible returns from his investment. The manner in which he has benefited science by his fearless acceptance of new principles—the glory which he has secured for his country by his indefatigable efforts and the daring of his enterprise—all this and much more to his credit entitles him to every consideration and respect. But in addition to this he possesses one more virtue which shines clear and brilliant above all others; that is the generous

spirit in which he reaches down and grasps the hand of the ambitious, thinking workman. There is the keynote to American industrial success. It is this spirit which has, to a great extent, nullified whatever evil there might be in the influence of overzealous labor unions. In using the brains of his workmen to aid him, he has stimulated their inventive genius, encouraged their ambition, and inspired them with that feeling of self reliance that brings to the surface that which is best in man.

While man's labor remains a purchasable commodity, there will always be conflicts between labor and capital, and for the person who can suggest some means by which these two elements can be brought sufficiently close together to prevent misunderstandings by viewing each other's contentions in the pure light of reason, there is no reward too great. In the pursuit of that object the employer should lead the way by managing his business in such a manner that he can afford to allow his workmen the highest remuneration for their labor. It is not a very pleasing sight, even for a workman, to see his employer's money squandered around the factory while he is pinched to supply it.

Looking at them as employer and employed, the manufacturer and his assistant, both animated by a spirit of justice and having in view one common ideal—that of national industrial success—let us follow them into the factory and see how it is possible to realize their ideal with the least amount of friction. The whole question of their relations hinges on the cost of production. As a result of their activity, the United States find themselves occupying a position in the industrial world to maintain which they must produce more cheaply than they have ever done before. Production has so far exceeded the requirements for home consumption that they are compelled to go into the foreign markets with their product and meet the foreign manufacturer on his own ground. Having once started in this direction they are compelled to continue or suffer an industrial depression. This is a point which should be brought home to the American workman so that he may understand the circumstances under which his employer is working and regulate his demands accordingly.

As before stated, the controlling question is simply one of cheap production, and the capitalist has very wisely decided to accomplish that object by curtailing expenses at the general expense end first. By the consolidation of business interests a much lower ratio of general expense results, consequently less necessity for reducing workmen's wages in order to meet competition successfully in foreign markets. Workers' wages should be the last thing to be touched unless they are glaringly out of proportion. Every item of general expense should be so classified as to permit of the closest scrutiny at all times in order to detect excessive waste and to determine whether changes in methods and systems cannot be effected and greater economy practiced.

The next question to receive attention is that of engineering. If the product is machinery, is the design such as will admit of the least amount of outlay in labor and material in its production? Can a cheaper grade of material be used in certain unimportant parts? Can it be arranged for a less amount of finished surface, a less number of operations, and a less amount of handling and transferring? Can it be reduced in weight? Can it be so designed as to permit of being finished on a more simple grade of machine tools? In a word, has everything possible been done in designing that machinery to permit of the lowest possible cost of production without impairing either its artistic value, its durability, or its general efficiency?

If so, then take up the question of tools, appliances, and facilities generally. Are the machine tools such as will give the greatest possible output, or will it pay to install special tools? If the product is a specialty, has the question of small special tools, such as jigs, templets, gauges, punches, dies, and attachments, by which production is promoted, been considered? Is the best quality of tool steel used for cutting tools? Is it such a grade as will stand the highest cutting speed, or is a cheap grade in use which will stand a speed of only thirty or forty feet per minute, while a steel can be bought in the open market that will stand eighty or a hundred, and in some cases more? Has the work been classified according to the skill required to perform it, and judiciously distributed

among the tools on which it can be done by the cheaper grade of labor? Has the labor properly been classified according to the skill required on the work on which it is engaged, or are we using skilled mechanics on work that should be done by handy men or boys? There is hardly anything around a factory so destructive to profits as the employment of skilled mechanics on work that requires little more than muscular effort to perform; besides, it is an injustice to a large class of workmen who, perhaps through no fault of their own, have not had an opportunity to learn a trade and become skilled. It is my firm conviction that if a man has been skilled to that pitch of perfection where he considers himself above and beyond the reach of the common laborer, he should be employed, as far as possible, only on work worthy of his skill. We can appreciate the pride, if not the judgment of the moulders on this point when as a rule they refuse to operate moulding machines, considering it beneath their dignity.

Unfortunately, the same high sense of honor does not exist among the machinists. There is no reason why a laborer should not operate a machine tool so long as the work to be done requires little or no skill. It is not the machine a man operates that makes him a mechanic, but the skill required in the work that he performs. My sympathies are with the laborer who must live and be a respectable citizen on a dollar and a half or less a day. Fortunately, through the invention of automatic and semi-automatic machinery and the standardization and specialization of product, avenues have been created through which the common laborer of thirty or forty years ago has advanced himself to a higher position in the industrial world and what is left of the place he vacated is now occupied by what is considered an element of inferior ability from continental Europe. The common laborer of old is the handy man of to-day, and he is just as essential as the skilled mechanic. We can find him through most American factories doing much of the work once done by the old all around mechanic; and with the improved facilities which he uses he is doing it not only as well, but in greater abundance, thus elevating his own position as a workman and assisting his

employer to bring his product within the reach of a greater number of consumers.

There is much to be gained by a judicious distribution of the work among the tools and a proper classification and organization of the help. Their movements also should receive close attention. In walking through a shop, it takes but a glance of the practiced eye to determine the actual condition of affairs in every department, and the amount that is being lost through apathy. Fortunate is the manager who from a superficial observation can detect this and see whether tools are operated to their full capacity or whether apparent activity is feigned. There is no mistaking the eager, active, animating spirit that is visible in a well governed factory—a factory in which every man knows his duty and understands that he will be held strictly responsible for the faithful performance of it.

It is unfortunate that there should be such a lack of uniformity in the task required for a day's work. What is considered a day's work in one place is frequently but a half day's work in another. This condition exists not only between different factories but often between departments of the same factory, thus producing a very bad influence on the help. While it seems impossible to improve this condition in so far as it relates to the different factories, with the more perfect organization of the manufacturers something might be done in that direction. In line with this comes the question of discipline and the observance of factory rules. Too often this refers to the shops only. No department should be exempt. Discipline, like charity, should begin at home and the office is the place to start it, as that department should serve as a model for all others. Rules of discipline should be as few as possible, but there should be a strict enforcement of those few. In some shops notices are posted at every turn notifying the help that unless they do, or do not do, so-and-so they will be immediately discharged. It is my experience that in places where notices carrying this terrifying threat are most numerous, discipline is most lax, because the threat is seldom carried out. A plain statement of what is required of employees and an example made of the first deliberate

violation will be much more effective. Less threats and more dismissals will be much more beneficial, because the help will soon realize that when a rule is issued it is going to be enforced, and they will govern themselves accordingly. Discipline should not be administered so as to make men feel as though they were criminals by the enforcement of useless irritating restrictions, but rather to inspire them with a knowledge of that conduct which is necessary to the success of their employer's business.

Next in order is the prevention of waste in material, supplies, etc., and to govern this requires a knowledge of the most modern practice. What is frequently considered as waste in one factory is a source of revenue in another. Great care should be exercised not only in the purchase of material in such form, quantity, and quality, as will give the most economical results, but in the final disposition of the scrap and refuse generally. In the foundry, facilities for extracting the shot from the cupola dump have been made so complete that the operation is one of the best paying features about that department, and in tests which I witnessed when the shot thus secured was melted without any mixture of pig, a very desirable grade of iron was obtained. Still we find facilities for accomplishing this in very limited use. Refuse from all other departments should receive the same close attention. The use, or rather the abuse, of supplies is often the source of considerable leakage. In fact, leaks are likely to occur anywhere along the line, both in material and labor, and the best way to guard against them is to know where to look for them.

As an evidence of what can be accomplished in this direction I may cite a case in a factory with which I was connected. In the first department to receive attention on the lines indicated in the foregoing, after a very slight effort, and that under unfavorable circumstances, a reduction in the labor cost of the product amounting to nearly 18 per cent was realized, without any diminution in the average earnings of the help, but rather an increase. This was in a department which was considered modern in most respects, and as it employed several hundred men, largely mechanics earning good wages, it can be seen what such a saving amounted to in

a year. All other departments were treated in the same manner and a saving realized according to the condition in which they were found. The means by which the minimum cost of production can be reached are numerous and depend largely, of course, on the line of manufacture in which one is engaged; but perfect system and organization backed by good executive ability are absolutely necessary. When the employer has got his business so arranged that all sources of profit or loss are under perfect control, he will be in a position to decide whether he can afford to grant a demand for an increase of wages, or must ask for a reduction. The chances are, however, that when his business is in that condition it will not be necessary to ask for a reduction in order to meet competition, excepting during periods of extreme industrial depression. In order to avoid the necessity of a reduction, the workman should not murmur if he is requested to produce a good day's work in order to insure a good day's pay. He must remember that he is no more entitled to extraordinary remuneration than his employer is to extraordinary profits, and his co-operation is necessary to the realization of both. If he follows the inclination of his union to measure his service by European standards, he must be prepared to accept European conditions; for he can no more expect an American day's pay for a European day's work than his employer can expect an American day's work for a European day's pay—and in order to insure that advantage to his employer by which he can accord him that substantial recognition to which his record and achievements entitles him he must, in the language of the shops, toe the mark in line and harmony with his employer.

MACHINERY AND LABOR.

BY HENRY WHITE.

[Henry White, secretary United Garment Workers of America, 1896–1904; born in Baltimore, May 21, 1866; graduated from the public schools in New York; served apprenticeship to trade of clothing cutter; journeyman at 18; organized a secession movement which resulted in the organization of the United Garment Workers of America, affiliated with the American Federation of Labor; editor the Garment Worker, and writer of many articles on the labor question.]

This subject is one which involves the whole industrial problem. It is the complexity of conditions due to the introduction of machinery which has caused the wide differences of opinion upon the question of wealth distribution. Under the simpler methods of industry the manner in which the proceeds of labor were divided was readily understood; to-day, however, the system is so highly organized that there is much confusion as to its operation. The perplexity is so great that many who see in labor saving inventions some malign purpose, and others again who discern that any means which enhances the productiveness of labor must benefit mankind, are unable to comprehend the manner by which that result is effected. The habit of judging the operations of so complex a system by the effect upon special interests instead of viewing it as a whole, accounts for the common misconception regarding the function of machinery.

If people were to consider how meager would be the rewards of toil without the aid of machinery, how costly the necessities of life, and how small the purchasing power of the laborer, its uses would soon become apparent. The confusion is heightened by the dual relation which a person occupies as a producer and as a consumer. As a consumer he benefits almost at once by every saving in effort, while as a producer his means of a livelihood may in consequence be threatened. The laborers thrown out of work by a machine, or even the merchant forced out of business through some combination, cannot be expected to appreciate the beneficence of such economy. In both cases their horizon is limited to their own