Welfare Work in Germany—IV

Housing, Feeding, Amusing, and Pensioning Workingmen on Business Principles

By Waldemar B. Kaempffert

[*This is the fourth of the series of articles by the Managing Editor of the* SCIENTIFIC AMERICAN *on German industrial conditions. The author was sent to Europe by the publishers of the* SCIENTIFIC AMERICAN *for the express purpose of gathering the information on which this series of articles is based.*]

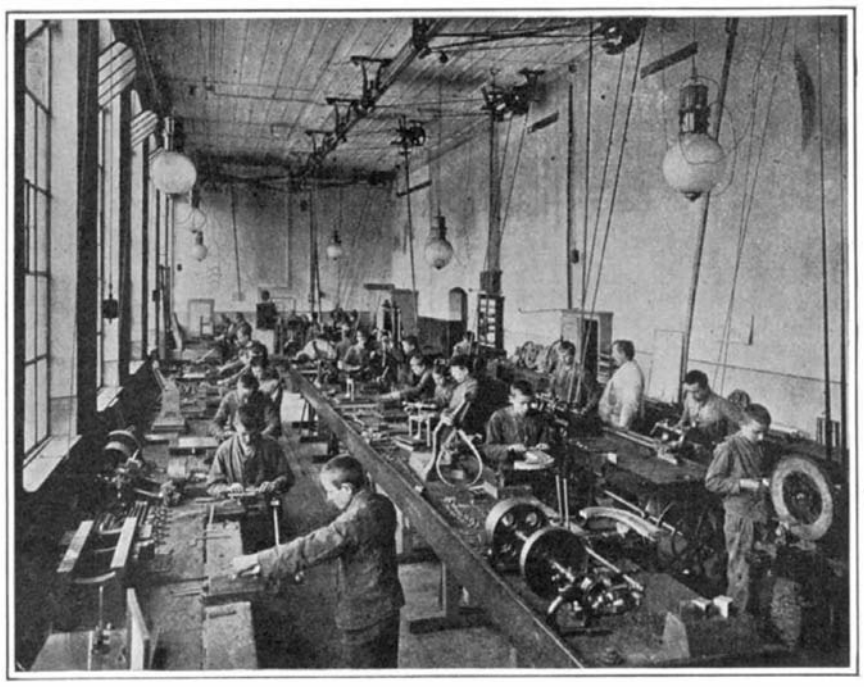
IF you, as a manufacturer, are compelled by law to pay insurance premiums on the life, health, and physical condition of your employees; if, furthermore, you are required to safeguard all dangerous machinery, to provide large and airy work rooms, you would probably feel that your bank account had been reduced by just so much, and that it was hardly necessary for you to devote much more attention to the welfare of those whom you employ. Not so in Germany. It pays in cash, so the German has found, to outdo the Government in caring for the workingman.

Fuel for the Human Machine.

A mechanic works better in good surroundings than in bad. The factory laws in Germany outline a minimum of goodness. The German employer makes no attempt to attain a maximum, but something considerably above that minimum. He sees to it that his factory is a brighter, cleaner, roomier, safer place than the factory laws stipulate that it shall be. If a man works better in good surroundings, he also works better if he is fed well. It pays to shovel good coal under a boiler. Why should it not pay to give a man good food? After all, a man is a machine, and food, like coal, contains so many heat units. If it pays to use coal containing the maximum number of heat units in order to get the maximum effect out of a steam engine, why should it not pay equally well to supply food-fuel also containing the greatest possible number of heat units and get out of the human machine the maximum effect in mental and physical work? So we find that the big German employer buys food for his men as he buys his coal—on strictly scientific principles. He does not give the food away, but he sells it far below its cost. Increased efficiency more than compensates him for the loss. At Elberfeld the men of the great chemical works can buy a meal at a price that varies from ten cents to seventeen cents and that in no case exceeds a weekly total of ninety cents. The Badische Company, at Ludwigshafen, sells one-third of a pound of beef or pork and one quart of soup and vegetables for five cents, the actual cost to the firm being ten cents. Coffee. with milk and sugar, is supplied for half a cent.

Apparently it is not enough to supply men and women with good cheap food. They must be able to eat it in comfort. Special dining halls and canteens have been erected for that purpose, which are also places of recreation, for they are open not only at meal time, but also before and after hours. Even the workingmen who prefer home cooking, whose meals are brought to them by their wives or their children, are provided for. The Badische Company, for example, has erected for their use a special dining hall outside of the factory, surrounded by a garden and shade trees, a dining-room which is big enough for 240 persons, and in which the men can sit with their wives and children during meals.

The effects of factory conditions upon health have also been studied. In huge chemical works steam apparatus must be employed both summer and winter. When the thermometer drops below 60 no inconvenience is felt; but in summer time there is a demand for cold water. In most American plants the ice water keg is emptied several times, on a hot day, not to the benefit of the workingman's health. An unhealthy employee is a piece of apparatus of reduced efficiency. Hence the Badische Company supplies coffee during working hours to the amount of 50,000 gallons a year.



A typical apprentice school of the kind maintained by German machinery builders.

Workingmen's dining hall of the Siemens-Schuckert works.

Modern tenement houses of the Krupp workingmen's colony.

Housing Systems.

The proper housing of employees gives the German manufacturer fully as much concern as the sanitary conditions of the work room. If he does not actually build the workingman's house for him he will either lend building money on very liberal terms or refer the workingman to a loan association.

German ideas in workingmen's colonies have changed vastly in the last twenty years. The early attempts resulted in unattractive communities not unlike the dull monotony of Pullman and Gary in this country. It seems as if the manufacturer had said to a contractor: "I have so many workingmen to house and so many acres at my disposal. Build me dwellings, costing so and so much, to the number of so and so many." One set of architect's plans served for forty houses.

Alfred Krupp was one of the first who departed from this simple plan; yet even his original colony is stilted in aspect. His successors have so far improved on his conception that the cottages and tenements of Essen, where 40,000 men are employed in the cast steel works alone, may well be regarded as a model in every way.

The Krupp ideas have been changed by the very force of circumstances. In the early days, when land was cheap in Essen, individual cottages could be built. Nowadays that is impossible. Such is the value of real estate that tenements must be constructed—tenements, however, so planned that to the uninformed visitor they seem more like the apartment houses of a prosperous middle-class community.

We Americans have been accustomed to regard Gary as a unique example of a town built to order around a great steel plant. A counterpart of that performance, but far more artistic, may be found at Leverkusen, opposite the city of Cologne. To Leverkusen the great coal-tar dye works of Elberfeld have transferred their activities; but at Leverkusen, it so happened, there were no accommodations for workingmen. The creation of these accommodations was carried out in a way that would hardly be expected of a manufacturer. Houses were designed and built that bear comparison with the best suburban villas in this country. What is more, amusement places were established, for at Leverkusen there was no theater, no lecture hall, no place for recreation.

So, too, the great chemical factories that cluster around Frankfort (the Griesheim-Elektron works, the Leopold Cassella plant, and the Hoechst plant) all have their workingmen's colonies, built at enormous expense. One colony alone consisting of 550 dwellings for 3,000 workingmen was established by the Badische Company at a cost of $700,000. The weekly rental of the smallest type of dwelling is the mere pittance of one mark and eighty pfennigs, equivalent to nearly forty-three cents in American money.

Workingmen at Play.

Germany is the land of *Gemuetlichkeit*, a term for which there is no exact English equivalent. *Gemuetlichkeit* is the result partly of cheerful surroundings, partly of cheerful company, without any trace of formality. It plays so large a part in German life that an employer of labor has to consider it. Hence it is that manufacturers encourage the formation of workingmen's clubs and societies and contribute liberally to their support. There is, of

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course, the inevitable German singing society, and the inevitable German band, supplemented sometimes by a string orchestra, all maintained partly by the workingmen, partly by their employers. Amateur theatricals, visits to museums, recreation of an educational character are everywhere to be found. If a Madam Curie discovers radium, forthwith a lecturer is engaged and holds forth in popular language before the various factory clubs and organizations on the new discovery. If a Richard Straus composes a "Salome," the musical critic of the local newspaper is asked to point out the beauties of the new super-Wagnerian music. If a Mona Lisa is stolen, there is bound to be a lecture on Leonardo. If a war breaks out in Tripoli, the moving picture transports the men and women of Leverkusen, or wherever it may be, to Africa and shows them Turks and Italians preparing for conflict.

Schools, too, there are—schools to educate the sons and daughters of employees, schools where children of workingmen learn wood carving, weaving and handicrafts, schools where housekeeping and needlework are taught, maintained partly by the workingmen, without compulsion, and partly by the employers.

Insurance and Pension Systems.

In the last article of this series the State system of workingmen's insurance was sketched. Big German corporations have established in addition, private insurance systems of their own for the benefit of their employees. As a body they spend millions on these supplemental insurance schemes. How much more they do than the government actually requires is illustrated by the case of the Elberfeld works, to mention a solitary example. In 1910 that firm paid out $65,261.22 in accordance with the insurance laws, but the voluntary contributions of the firm to its own insurance fund amount to $443,246, more than seven times more than the State required.

Almost every self respecting German manufacturer who employs several hundred men maintains a pension system of his own regardless of what the government may dictate. Among the larger chemical works, for example, invalid workingmen who have been in the employ of the firm for more than five years or men who have been with the company for thirty years are entitled to a pension. To be sure the workingmen pay in to the insurance and pension fund a certain amount of money every week, usually between three and four per cent of their wages, if they are not more than five marks a day; but the employer usually contributes by far the larger share. Moreover the workingmen's payments are voluntary.

The Jena System.

Welfare work of this kind did not meet with the approval of one of the most remarkable men that Germany has produced. He was the late Prof. Abbe, the associate of Carl Zeiss, who founded the great optical works at Jena. Abbe felt that because all industrial welfare work is largely philanthropic it is radically wrong in principle. The employee should receive the benefits of insurance, of pension systems, of proper sanitary conditions in the workshop, of free medical attendance in case of sickness, not as a beggar receives alms, but he should be able to demand them as a matter of right. Accordingly Abbe devised a system which, on paper, would seem to be hopelessly impracticable, but which has proven brilliantly successful in actual practice.

His vast fortune Abbe converted in his lifetime into a trust fund for the benefit of his employees. Their rights to that trust fund were codified in a set of rules, "statutes" Abbe called them. To give these the force of law Abbe had them accepted and ratified by the Grand Duchy of Saxe-Weimar, so that they became part of the Duchy's laws.

Every manufacturer pays his men according to the market price. Abbe devised a different system. At Jena wages are paid on a basis determined by three distinct elements—a minimum weekly wage; the amount actually earned, and a supplementary wage payable at the end of the financial year. The minimum wage is fixed. It cannot be reduced but must always rise. If the times are bad, if there is a breakdown, if a legal holiday intervenes, that fixed minimum wage is always paid. What he earns above that wage depends upon the workingman's ability. The supplementary wage, which is in the nature of a bonus, is of course dependent to a certain extent upon the amount of business doue in a year. During the fifteen years in which the system has been in force an average annual bonus of eight per cent has been paid. Overtime work, night work, Sunday and holiday work are paid for at a higher rate.

In 1900 it occurred to Abbe that nine hours a day are more than any man ought to work. Accordingly the workingmen were asked by the board of managers whether they were willing to turn out the same amount of work in eight hours and receive nine hours' pay. The vote was overwhelmingly in favor of the change. For the last twelve years the works have been placed on an eight-hour basis.

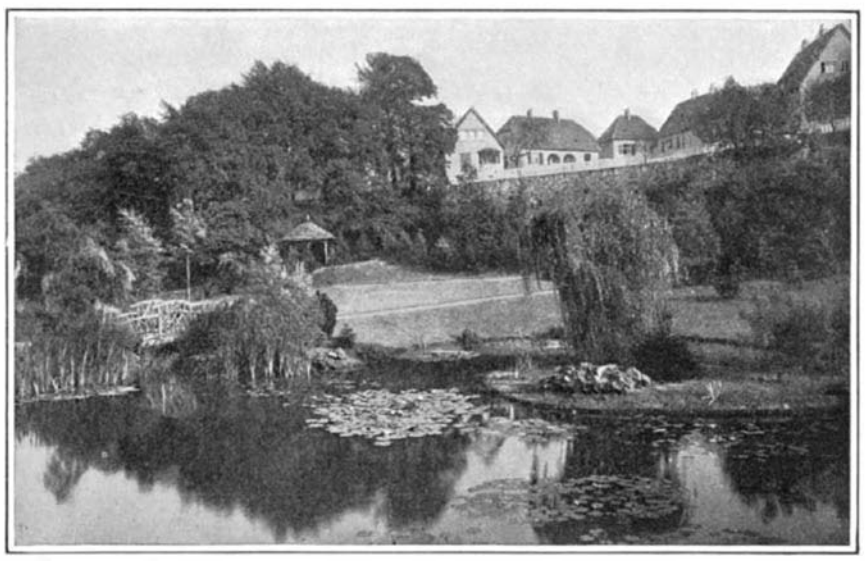
After one year's service every employee in the works is entitled to six days' holiday with full pay and six days without pay. If the vacation thus allotted is not taken in one year it may be added to the vacation of the following year.

Abbe had interesting ideas on the obligations of the employer. He regarded as monstrous a system under which a man is employed with the tacit understanding that the employment is to be permanent, yet permitting the discharge of the man at any moment if the employer so wills. The opportunities which the employee might have embraced have been lost, perhaps forever. Abbe regarded it therefore as socially desirable that men whose services are no longer required should be furnished with enough money to keep themselves while seeking new work. Hence he devised a method of legally securing a workingman who may leave the employ of the firm. After a service extending over three to five years a dismissed workingman is legally entitled to full wages for six months. If he has been employed for a shorter period, he receives less. Only grave misconduct and repeated breaches of the "statutes" constitute sufficient grounds upon which the payment of compensation may be refused. A man, for example, who has been in the employ of the firm from three to five years and has been earning a minimum weekly wage of 25 marks ($6.25) would receive a compensation of 650 marks ($162.50) on leaving.

The University of Jena, too, was given a claim on the trust fund; for Abbe felt that without scientifically trained men the optical works could not endure. Hence he saw to it that among the graduates of that famous institution there are always a number of competent mathematicians and chemists who can be taken over by the scientific staff of the works.

Nowhere in all the world can be found so shining an example of science applied to the sociological problems of a great industrial corporation as at Jena. Abbe's scheme has proven brilliantly successful because it was conceived by a man who had brains and a heart.

Workingmen's houses at Nurnberg, in which chiefly machinists dwell.



A glimpse of the workingmen's colony of the Krupp cast steel works at Essen.

WELFARE WORK IN GERMANY

The Influence of Light upon Ferments

SUNLIGHT tends to reduce the activity of certain ferments, or even to destroy it in the presence of air or oxygen. In order to find out whether this action varies with the different light rays present in sunlight, Henri Agulhon made experiments.

When ultra-violet rays were made to act upon sucrase, laccase and tyrosinase placed in a vacuum, these ferments were partly destroyed. In the presence of oxygen, the effect was much stronger. When visible light was used, there was no effect whatever in the absence of oxygen. Since the destructive action is presumably an oxidation, it is necessary to account for the action *in vacuo*. Mr. Agulhon accounts for the processes by referring to the results of Miroslav Kernbaum's experiments upon the action of ultra-violet rays on water. Kernbaum found that these rays decompose water, thus introducing free oxygen. When the action is in a vacuum, the excess of hydrogen is liberated; but in the presence of oxygen, hydrogen peroxide is formed. That this is the true explanation of the effect of ultra-violet rays upon the ferments is further inferred from the fact that laccase and tyrosinase are entirely destroyed after four hours in the presence of only one-half per cent of hydrogen peroxide. Of course the presence of water is assumed in all cases.

That the water is concerned in the action of ultra-violet rays upon the ferments is shown by an experiment in which a glycerine solution of tyrosinase was exposed in quartz for three hours without suffering any deterioration.

But other ferments do not behave in the same way. Emulsin is decomposed even by ordinary light acting in a vacuum. The ferment catalase taken from the fat of swine and from the liver of calves was used in experiments with visible light and with ultra-violet light. This ferment was also destroyed by daylight in a vacuum, although not as rapidly as in the presence of oxygen. But the destruction of the ultra-violet light was considerably less in the absence of oxygen.

A third type of effect is shown by rennet. This ferment is unaffected by visible light, but is readily destroyed by ultra-violet rays either in the presence or absence of oxygen.

Mr. Agulhon summarizes his work by classifying the ferments into three classes, according to the action upon them of light rays.

1. The first group contains ferments like sucrase, laccase and tyrosinase. These are attacked by visible light in the presence of oxygen, and are rapidly destroyed by ultra-violet rays even in the absence of oxygen. This is simply a case of oxidation and is easily explained.

2. In the second group are catalase and emulsin. These are destroyed by all rays *in vacuo;* more rapidly in the presence of oxygen.

3. A third group is represented by rennet. This behaves toward ultra-violet rays like the others, but is unaffected by visible light.

Whether the differences in the behavior of these ferments are due to the presence of other substances with the ferments, or to the nature of the ferments themselves, is not known.

Photo-electric Antimonite

NATURAL antimonium sulphide (antimonite) has been found to possess a photo-electric sensitiveness similar to that of selenium, but for there being no troublesome inertia. In fact, immediately after discontinuing the action of light, the electrical resistance returns to a figure practically identical with the initial "dark" resistance. The sensitiveness, however, disappears on melting or pulverizing the mineral, which suggests a connection with its crystalline structure.

In a paper recently submitted to the Royal Academy of Sciences, at Amsterdam, J. Olie and H. R. Kruyt examined the behavior of artificial antimonium sulphide, heated in sealed evacuated tubes of high-melting glass, raised in a special furnace to a temperature of about 650 deg. Cent.

Absolutely pure antimonium sulphide is found to possess a photo-electric sensitiveness comparable to that of natural antimonite, its conductivity sometimes rising from 100 to 500. Much higher effects could, no doubt, be obtained by an increase of the surface. The composition of the glass seems to exert a marked influence on the success of the experiment.

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