From the Author

ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE.

ADDRESS

TO THE MEETING AT YORK, SEPT. 26, 1864,

ON THE

EFFECT OF MANUFACTURING DISTRESS,

ON

MANUFACTURING PROGRESS,

AND ON THE

Improvement of the Condition of the Wage Classes,

IN AGRICULTURE AS WELL AS IN MANUFACTURES.

BY THE

PRESIDENT OF THE SECTION ON ECONOMY AND TRADE,

EDWIN CHADWICK, Esq., C.B.,

Corresponding Member of the Academy of Moral and Political Science of the Institute of France.

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Address

BY

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CORRESPONDING MEMBER OF THE INSTITUTE OF FRANCE.

ON ECONOMY AND TRADE.

AT this meeting in the vicinity of the most considerable manufactures in the Empire and in the world, we are compelled to give our most serious consideration to the chief social and economical questions which have arisen from the external civil war, that has shaken our gigantic system of cotton textile production almost to its foundation. To elucidate the economical principles which govern its progress and influence the condition of the people engaged in it, I beg to submit some facts derived chiefly from early examinations as a commissioner of inquiry charged with the preparation of the Bill, by which official inspection for the regulation of labour in the textile manufactures, and also the half-time system of labour and instruction for young children, were introduced.

At Calicut, at the extremity of India, from whence calico was first derived, a poor Hindoo spinster, with a primitive distaff spins, from cotton grown on the spot, in a day about a mile of thread, for which she earns twopence; or for the labour of spinning a pound, of the sort called forties, 19 miles in length, she earns three shillings. There, too, a poor Hindoo weaver goes from place to place, spreads in the open air, a loom of a more primitive construction than the sort depicted on the pyramids, in a space under a tree, for which he pays no rent, and weaves the yarn so spun into a web of cloth, at wages of little more than a handful of rice a day. From that same district, the Anglo-Saxon buys up the growth of raw cotton, conveys it, by expensive land transport on horseback, to a vessel, in which, perhaps, more than £20,000 have been invested, carries it a distance half round the world to a port whence it is conveyed by steam power to a manufactory containing machinery, the result of the genius of Watt,

Arkwright, Crompton, and others, in which perhaps £100,000 of capital have been invested,—in which there is steam power exceeding that of 3,500 men, impelling 150,000 spindles, delivering nearly 500 miles of thread a minute, or during the day, a length of thread that would wrap twelve times round the world. This machinery, which does the spinning, is attended to and fed and ministered to by about 1,000 servants—men, women, and children—at wages, on the average, to each of about ten times more a day than those of the Hindoo spinster. The yarn so spun is taken to be woven in an immense shed, comprising machinery, in which some £80,000 of capital is invested on a thousand power looms, attended to by men at 2*s.* 6*d.* a day; the web so wrought up is usually printed in another great establishment, where the genius of chemists has been brought to bear for its decoration, and it is carried back again to the extremity of India, and the labour of the poor Hindoo spinster, and also that of the poor, rentless, rateless, and taxless Hindoo weaver, is undersold, and though they work for the barest existence, their industry is superseded even with their own material taken from the spot. As illustrative of the progress of this manufacturing system, and with it the progressive reduction of manufacturers' profits on the piece, I have been told that there were persons recently living who saw a stockingless boy carrying milk in the town of Bury—saw that boy become a cotton printer by hand—then a great manufacturer by machinery—then a Member of Parliament, and a Baronet with a princely fortune—the father of a Prime Minister, and the founder of a house of Statesmen. On a late visit to Manchester, I was shown some cotton cloths, printed with dyes brought from India, of a pattern and sort printed by the first Sir Robert Peel, that were to be sent out to India, and sold there, cloth, printwork and all—at about half the price at which he had made his great fortune for printing alone. Nor, as respects India, is this success confined to inferior fabrics for common use. A lady, the wife of an eminent cotton manufacturer, went to him one day rejoicing, with a fine piece of muslin as the produce of India, which she had bought in town, and showing it to him, said, if he produced a fabric like that, he would really be doing something meritorious in textile art. He examined it, and found that it was the produce of his own looms near Manchester, made for the Indian market exclusively, bought there, and re-sold in England as rare Indian manufacture. In Manchester they can spin the yarn for that "woven wind," for a transparent cloth, such as is seen on the Pompeian pictures, and such as Indian princes prize for the

beauties of their Harems; and the rare industry of Mosul on the banks of the Tigris—the Mosullaine—will be overthrown. In the International Exhibition, there was thread spun by the Messrs. Holdsworth, a pound of which was 320 miles long. In 1860, Great Britain exported 240 millions of pounds of yarn and goods to India, and was fast becoming the clothier of its population. But wages there are rising under this industrial influence, and the natives would do better to betake themselves to the culture of cotton, of indigo, and of teas, for all which labour is in demand, than to compete with machinery in working up cloth for themselves. If revenue and protective duties were withdrawn, scarcely any foreign manufacture could withstand the British capital and machinery. Austrian and French manufacturers have told me that if they were free to invest their capital in manufacture, they would prefer to invest it, even in the district of restricted half-time child's work and the short time adult Lancashire labour. Pashas of Egypt have tried to manufacture the cotton grown on their own territory, and have been beaten. Even our American relations, with superior cotton on their own territory, can only defend themselves by tariffs against the superior productive power of Lancashire. The progress of our cotton production may be represented by the fact, that the cost of the pound of No. 40 yarn cotton included was in 1812, 2*s.* 6*d.*; in 1830, 1*s.* 2½*d.*; and in 1858, 11*d.*

Now it is to be observed, and the observation though an unpalatable one, is important to be made at the present time, that this great manufacturing improvement has been due mainly to successive periods of manufacturing distress. It was an axiom of the late Mr. John Kennedy, who was called the father of the cotton manufacture, that no manufacturing improvements were ever made except on "threadbare profits." When the trade is doing well, the axiom is, that they cannot be better than well, and they remain as they are. But when the market is overstocked, or when, from any other cause, there is no sale at the then prices, the manufacturer, whose machinery is unemployed, and large capital wasting, is in the position that it is better to go on even with serious loss, for a time, than have his machinery deteriorated by want of use, and his organised labourers, whom he may not get together again, dispersed by stoppage. In such crises his nerves are strained, as much as any officer's in a military command, and his mind is tasked, even with the aid of new divisions of labour, of brokers to buy his raw material, and of agents to have an outlook and sell his produce. Being under heavy penalties for every day he fails to find work and wages for his corps, he is

driven to his wit's end to exercise invention, and listens greedily to any which bids fair to cheapen production, lower prices, and stimulate consumption. A manufacturer loudly complains of distress, but he is not believed, because he is seen to be extending his works: really he is extending his works because he is distressed, for he is trying to spread establishment charges over a larger amount of production, and thus reduce its cost. The reduced prices, obtained by such improvements, including mechanical labour-saving improvements, stimulate consumption amongst a lower and more numerous grade of society, and place it on a wider and steadier basis; there is an improved demand, and restored net profits, on the wider sales at reduced profits; and a restored and increased demand for labour, and an advance in wages. Manufacturing distress, moreover, promotes the extension of foreign consumption. Stocks of goods being unsold and on hand, the manufacturer does not like to go about with "sacrifices," or throw them upon the depressed market at home. He has a young fellow, a son, or some one else whom he trusts, and he sends him abroad with a shipload of goods like a travelling packman—on a venture to most remote parts of the world, to get any produce in return for them: ivory, skins—anything that will sell at home, or anywhere else. The foreign purchaser of cotton prints, who has got these adornments at low prices, has a strong motive to get them on the backs of the natives, and once on them, there is admiration and a permanent demand for them, as there is now, not only in the remote parts of India, but in China, Egypt, Asia Minor, Greece, Turkey, Persia, Mexico, and the Brazils. By such successive adventures under pressures of distress, the consumption and production had been raised in 1860 to 76 millions, or six millions more than the gross revenue of the United Kingdom; of which the declared value of the exports was 52 millions. The wholesale dealers put 10 per cent. generally on the price of the manufactured article, and the retail dealers generally add to that 20 or 25 per cent., or, on the whole, some seven millions to the twenty-four millions paid for the cotton produce consumed at home. Of the price paid by the consumer of cotton goods, about one-tenth is generally the interest of capital and the average manufacturers' profits, one-sixth wages of the wage class, one-third the remuneration for distribution, and where the cloth is sold worked up into garments the total cost of distribution generally constitutes one-half of the sale price.

This great extent of production and of consumption could not have been attained, and sustained under difficulties, and

have prospered by the mechanical inventions and appliances, except in the hands of a population, whose power of patient steady work, especially the females, is by foreign workmasters admitted to be unsurpassed, if it be anywhere equalled. Herodotus relates that Darius, the great king, amongst the various races by whom he was surrounded, once observed a woman of one of them leading a horse from the water and carrying a vessel of water on her head, and at the same time plying a distaff as she went along. He was struck with this display of industry, and being told that it was characteristic of her tribe or race, he ordered that the people with such precious qualities should be removed for colonisation within his own dominions. The men as well as the women of these northern districts might have sprung from that race. As against them all other, the lowest paid labour that has been tried, that of the Hindoo and the Fellah of Egypt, even with British machinery and British taskmasters has everywhere hitherto failed.

But what has been the effect upon wages of the continued reduction of price of production, the consequence of the repeated pressures of distress? For a long time, it was maintained, and sometimes it is now maintained, and it is illustrative of the state of information that it should be so maintained, that the effect of these improvements has been continually to reduce wages. In some branches it really has been so, as in the instance of hand-loom weaving, which at first was a labour for the production of high priced goods for the supply of the few. At the beginning of the century, 1*s.* a pound was paid for the spinning of a pound of cotton yarn of shirtings, of number forties. In 1830 it was 7½*d.* Now the cost of spinning a pound of that same yarn, which the Hindoo spinster could only spin for 3*s.* by the distaff, is by machinery only 3*d.*, interest on capital, wear and tear of machinery, and the agency of the attendants called spinners—all included. But in the beginning of the century the wages divided amongst the workers engaged in a cotton spinning manufactory amounted only to 4*s.* 6*d.* per week per head:—now in periods of full work it is 10*s.* 6*d.** and 11*s.* per head, man, woman, and child—averaging 30*s.* per week amongst a family of three, or 40*s.* to a family of four!

* I believe this to be an under estimate. The Blackburn Relief Committee have made a recent report, in which they show that the earnings of 25,865 persons—men, women, and children—cotton workers, who were thrown out of work during the cotton famine, had averaged 11*s.* 5*d.* per week, and Blackburn is not a place noted for full wages. Added to these were 3,000 mechanics dependent on the cotton manufacture, whose wages had averaged 25*s.* per week.

—namely, for a man, at least 18*s.* 6*d.*; woman, 10*s.*; boy, 7*s.*; girl, 5*s.* The tendency of the pressure of hard times in the manufacturing districts has been, and is, to put more and more of machinery and capital under the superintendence of one person. But this is to require more and more of intelligence and trustworthiness, of discretion as well as skill. The machinery which has been under the care of two men at 18*s.* a week, is in hard times, for the sake of economy, put under the care of one; but this one must be a man of higher order of discretion and trustworthiness, and he must have wages which will give him an interest and responsibility in his work, and one at 25*s.* or 30*s.* is got, or double the actual money wages in the agricultural districts. This is a tendency in other branches of manufacture, and hence wages in various branches have been advanced, notwithstanding manufacturing distress, and indeed in consequence of it. Thus in 1842, the wages paid by Mr. Henry Ashworth for the production of 20lbs. of yarn on 800 spindles were 4*s.* 7*d.*;—a spinner, or rather a superintendent of machines being employed, who earned 20*s.* per week. In 1859, however, 1,600 spindles were put under the care of one man, with a little extra assistance from boys, and only 3*s.* 11½*d.* is paid for the production of 20lbs. of yarn, but his net earnings in full work, had attained to 30*s.* 10*d.* per week.

The sort of common cotton cloth for the weaving of a piece of which by hand thirty years ago five shillings was paid, is now woven by power for elevenpence; the hand-loom weaver then earning ten shillings a week; the power-loom weaver, or superintendent of the weaving of three power-looms, now earning sixteen shillings and seventeen shillings a week. Of late difficulties have been overcome at Manchester in the application of the power-loom to the weaving of various sorts of silk. Our interests are in the social and economical advancement of our neighbours, and there are great divisions of labour for the ample future occupation of the working classes of France as well as of England. I beg permission in passing to call the attention of my *confrères* of the Institute to the fact, that the manufacturers of Lyons and other places may be warned, that unless they make advances in the use of power, and improve the condition of wage classes by it, their hand-loom labour may be superseded, for the power-loom takes the same relative position to the hand-loom in silk that it does in cotton. Mons. Jules Simon observes, that heretofore the manual labourer has been an intelligent force, but by machinery he is converted into an intelligent director of force. In our most improved manufactures, however, the services of a few

are required as intelligent directors of force, and of the many rather as intelligent attendants upon it. If the French manufacturers adventure upon the new machinery and its contingencies, I must presume that they will have no difficulty in obtaining the intelligent services needed for it from amongst their own people, but they must adopt the machinery or give up the manual labour. Manchester awaits their determination!

The progress of machinical production and of wages, might be more strikingly illustrated in another field of industry, that of the lace making trade of Nottingham. In 1810, a lace making machine made a square yard of plain lace in two hours, and the finished yard was sold for five pounds. Recently the machine made a square yard of the same net in five minutes, and it was sold in 1856 at sixpence. Notwithstanding prohibitory tariffs, the effect of the Nottingham production on much of the poorly paid hand labour of Belgium was similar to that of the cotton yarn and cloth of Lancashire on the hand labour of the Hindoo spinster and the weaver. The wages for plain lace making have advanced from 20*s.* to 21*s.* per week for men, and from 12*s.* to 16*s.* for boys. For ornamental lace the wages are higher. For a long time English ladies re-smuggled back from the Continent lace that had been smuggled there from Nottingham. Roman Catholic priests in Belgium and elsewhere have adorned themselves with lace vestments, and have celebrated their rites before altars decorated with new gorgeous lace cloths, imagining them to have been wrought in nunneries, or by the faithful of the Roman Catholic flock; but the hand-labour of the poor pillow workers of that flock, toiling hard, at a rate of five meshes a minute, for poor wages, which rendered unnecessary the prohibition of the use of meat on the Friday, and made their whole lives a severe fast, was superseded by the Nottingham machine-made vestments, produced by the machine at the rate of a thousand meshes a minute, under the superintendence of men whose wages for fancy work were 50*s.* or even 60*s.* a week. Machinery now appears to stay at nothing done by hand, provided there be sufficient numbers required to pay for its construction and use. As relates to the effect of the latest new machinery on wages, I may mention that the wages generally earned by the sewing machine, I learn from manufacturers, are more than double the average previously earned by needlewomen.

In the great stricken branch of the cotton manufacture, the earnings of 440,000 persons, of whom 90 per cent. were adults, and 56 per cent. of the adults females, for attending

to the working of machinery impelled by steam-power equal to upwards of 2,000,000 of men, averaged about eleven millions and a-half of money a year. Viewing this extraordinary combination of mechanical art and science, and of labour in production—the greatest that has been seen, economists and eminent leaders of industry in the neighbourhood had long expressed serious alarm that such vast interests should be apparently so entirely dependent on one source of supply and on one fibre. I might quote the speeches of southern slaveholders or leaders in their war of secession, that so absolutely did the very existence of Great Britain appear to be dependent on the continuance of the supply from them, that they impudently relied upon it, for compelling the interference of England in their behalf, even for the maintenance and extension of slavery. Some of them went so far as to propose that the exportation of cotton should be prohibited, in order by starving the cotton manufacturing population to compel the acknowledgment of the Confederacy. As events have occurred, I believe it would have been well for England if every pound of the store of cotton in the possession of the Confederates had been at once burned, in order that exertions for the development of supplies from new sources might not have been weakened and delayed as they were, and are yet, by the apprehension that by peace or the fortune of war, the large amount of cotton hoarded up might at any time be let loose upon the market to the ruin of investments in new and necessarily more expensive sources of supply.

I have indicated some of the leading economical facts influencing production, distribution, and the progress of wages for the past, to see what economical and social lessons may be deduced from them for the future. It is to be observed, however, that the character of the distress brought about by the American civil war, differs from all preceding causes of considerable manufacturing distress in this, that whereas they, as I have described, tended, by reducing prices to extend consumption, this privation of more than eleven-thirteenths of the supply of the raw material, so enhanced its cost as vastly to raise the price of the manufactured material, and throw back manufacturing progress in that respect by half a century. Had not the use of the article been widely and strongly fixed in the habits of the consumers, the effect must have been extensively and permanently destructive. As the supply now stands, from all sources, it may be said to be at present about thirty-two against forty-seven of the supply in 1860, and in price 28½*d.* against 3½*d.* per lb. in 1860. It is estimated that less than two-thirds of the previous number of

workers are now engaged in the manufacture, the rest having migrated, or changed into other service, or emigrated. To those now employed, wages are nominally at the same rate, but really considerably less, in consequence, as stated, of the increased difficulty of working the Surat and other inferior cottons, and also from their being employed at short time.

The first effect of the present distress will, however, seemingly be to diminish future danger, by relieving the manufacture of the present extent of dependence on one source. The delay of a renewal of the American supply is now regarded complacently by many, as having, at all events, a compensation in allowing more time for the training of labourers and the organisation of the new cultures in other countries, which a sudden cessation of the civil war, and the liberation of the embargoed stores of cotton in the Confederate States, might check or destroy. If, however, the event of the civil war should be, what many are unwilling to believe, the destruction of the institution of slavery, from information on which I myself rely, as to the effects of the conversion of slaves into free labourers, working for wages, and at piece-work, and from the additional produce already achieved by coloured free labour on the estates formerly cultivated by slave labour, a considerable augmentation of the produce of raw cotton may be anticipated from thence, in two or three years' time. The cotton cultivation of India, or the rude labour of other places, will not, it is generally believed, withstand the culture of America, especially the free culture, the promise of which free cultivated cotton farms appear to justify. To what extent the culture may elsewhere be improved in quality, and increased in quantity, time only will show.

Inquiries which I have myself made into the domestic condition of the wage classes of our own population, lead me to the conclusion that they are even now very imperfectly clad, and that the consumption of cotton amongst them is not above two-fifths of what perhaps it would be, if all were as fully provided as are some few, who are frugal and good managers. Large classes of people have only two shirts, one off and one on. Not half, perhaps, of the children or of the adults throughout the country have stockings. Before the "cotton famine" the supply of wool did not keep up to the increasing demand for woollen clothing. There are yet greater deficiencies in the clothing of the wage classes of other countries. No doubt popular clothing admits of great improvement in the qualities of warmth preserving, combined

with lightness, cleanliness, and wear; and constant changes may be expected in the adaptation of fibres for these purposes, as well as for decoration, and for all other purposes. But our steam power and machinery and capital will probably keep us in a foremost position for clothing the masses of the people of the world. We may conclude, therefore, that not only will the hands which have migrated or changed to other temporary occupations be required again, but that a large and increasing number of hands must be sought to superintend the action of a vastly increased amount of steam power, and new machinery for textile production. Looking at the present as well as the past condition of the wage classes * of the manufacturing population; looking at the great physical evils attendant upon its present condition, of which the excessive sickness and death-rates are exponents; looking at the excessive moral evils of debauchery and unthrift which have accompanied it, of which the statistics of pauperism, as well as penal statistics, are also exponents,—there is good ground for the opinion of reflecting men that the manufacturing system, or this portion of it, has come upon the country too fast, that is to say, before the population was prepared by education and social progress for its good management, or the satisfactory application of the increasing produce of the manufacture in wages. It is just, however, to observe that the social effects deplored are not peculiar to the textile manufactures or to this one branch of them. In other branches, wheresoever there have been large aggregations of men for new manufactures, or large new works—assemblages of navvies for example—without order or preparation as to their domestic conditions and relations; high wages, and especially high and greatly fluctuating wages, are equivalent to an excess of drink. Nor are the evils peculiar to our own manufacturing populations. They have attended the extension of all the textile manufactures of France. They have been the subject of able and anxious examination by eminent men

* I object to the term "working classes," as involving mischievous fallacies and prejudices. "Manual labourers" is also objectionable, for manual labour, even the lowest, if properly performed, involves a greater or less proportion of mental labour. "Mental labourers" is objectionable too, for the occupations so designated involve manual labour, commonly with the pen, or severe bodily constraint, often worse than active bodily labour. The noble President of the Association is a "working man," who would have outworked several of the working men properly so called. An industrial leader, the head master of a manufactory, is often really the hardest working man in it. It appears to me, that the term wage classes is free from the objections stated, and others, and that it denotes really the leading characteristic distinctions.

of science of France and of Europe, comprised in the Academy of Moral and Political Sciences in the Institute:—Villerme, Louis Reybaud, and Jules Simon. Their reports and works display deplorable physical and moral degradation, attendant upon the progress there of mechanical production, some of it of a darker character than the evils presented to myself and my colleagues of the Factory Commission of Inquiry into the Effects of the Labour in the Textile Manufactures of Great Britain. Those who would see the social general results developed, by the latest inquiries in France, will conveniently find them displayed in a recent work of Jules Simon, "L'Ouvriére."

Another important subject before us is—What may be done socially or by legislation for the improvement of the present manufacturing population? What may be done for the population which is coming, to prevent or mitigate the social and economical evils attendant upon the past? And first, what may be done to avert or mitigate the periodical recurrence of distress, and outcries for external sympathy and aid; for, although it is to be hoped that nothing so extraordinary may again occur, as that which has arisen from the large loss of the supply of the raw material, yet experience warrants the anticipation of recurring disturbances from over production, from under consumption, from bad harvests, from changes of fashion, and from improvements in machinery. Change must therefore be regarded as a normal condition of our manufactures to be provided for in the interests of ratepayers, as well as of the employed.

In addition to the improvement which is to be looked for from an extension of several sources of the supply of the raw produce, as a means of preventing for the future the violent shocks and inconveniences occasioned by an almost exclusive dependence on one, there is a lesson of domestic prudence, on the like principle, the expediency of which, for families of the wage classes, ought to be strongly impressed upon them, namely, to avoid, as much as they can, having all the working members of the same family engaged in the same manufacture. The intensity and bitterness of the late suffering in these districts has been proportionable to the exclusive occupation of neighbourhoods as well as families with one manufacture. In places where cotton mills were isolated, or where those engaged in the manufacture have only formed a minority in the manufacturing population, members of the same family were more frequently engaged in different trades. If there was only one member of a family, or of a circle of relations, out of three, engaged in the paralysed occupation, he commonly derived aid

from the other two of his relations who were in full work; if not in money, in a share of their meals. But for such family and friendly assistance, and the assistance from friends amongst fellow-workmen, the public pressure of the late famine would have been far more severe. I learn from the continent that the shock has fallen there heavily or lightly in proportion as there has been a mixture of employments. The lesson taught, as to the distribution of members of the same family in different occupations, is in accordance with the common household proverb, "Not to have all your eggs in one basket." The expediency of this recommendation is disputed in the interests of manufacture; and there certainly are economical advantages in the aggregation of establishments of the same sort; but if that aggregation be maintained, those interested in it should be called upon to provide against its dangers and evils, or at least to promote actively the measures necessary to avert them. One of these evils is the long-continued congestion of unemployed labourers, on occasions of manufacturing depression. Early training and education, and the development of the intelligence and capacities for ready changes of employment, is one means of reducing these congestions.

Few who have not had experience in the administration of relief to the destitute in periods of wide distress can be fully sensible of the difference in amount of trouble and chargeability to the rate-payers, between educated and intelligent, and uneducated and unintelligent, people of the wage class—the heavy lumpishness of the uneducated, their abject prostration, their liability to misconception, and to wild passion, their frequent moroseness and intractability, and the difficulty of teaching them, as compared with the self-help of the better educated, who can write and inquire for themselves, and find out for themselves new outlets and sources of productive employment which no one else can find out for them, and who can read for themselves, and act upon written or printed instructions. The really well-trained, educated, and intelligent, are the best to bear distress; they are the last to come upon charitable relief lists, and the first to leave them. They are most easily helped. I remember when we promoted the migration of the surplus southern agricultural labourers to the north, that there were villagers in places who had heard of America and were willing to go there, but had not heard of Lancashire, and could not be got to move there even on the promise of largely increased wages, until they had sent one of their own people to see what sort of people they were in Lancashire, and return and inform them. The

uneducated workmen in Lancashire are more intelligent, but, if we are to believe a story told of some of them, they have been led to America by a recruiting song, the chorus of which was—

> "And we will drink at every ale-house that we do come nigh,
> Until that we get to the North Ameriki."

Instead of being kept crowded, as the adult workers recently were, in schools, to remedy the gross defects of elementary education, to teach them reading, and to keep them from hanging about the streets exposed to disorder, they would if they had already been properly educated have been abroad seeking occupations for themselves, for which their elementary education might qualify them. On a former occasion some got engaged in the police force, for which reading and writing are necessary. One operative who could read and write well, left his fustian jacket at home, put on his best Sunday clothes and went about to inquire for a shopman's place, or a clerk's place, which he succeeded in getting, and did well in. A great deal of the good conduct of the operatives has been owing to the extent to which elementary education in and the partial application of the factory half-school time system, has leavened the mass of workpeople; difficulties and disturbances have arisen entirely with the ill-educated.

When I talk of education, I presume an acquaintance with the different sorts of it, from the positively worthless to the better qualities in which the results, practical, moral, and physical, in combination with proper training, are proved to be most satisfactory:—from the inferior education in which, I have elsewhere shown, not one in three turn out well, to the superior training, in which there are not more than two per cent. of failures. The general and complete compulsory application of the half time principle of school teaching by good teachers, combined with early physical training, may be urged as a means of obviating future prolonged chargeability, from manufacturing changes and reverses such as those of the past. I add physical training, because to enable a manual labourer to turn his hand to anything easily, he should be early trained physically to turn his fingers as well as his hands to any work. The future of the wage classes will lie in large manufacturing processes, in which there must be action in concert; for this the military drill has great value by imparting habits of order, prompt attention, and exact obedience to command. Systematised physical training imparts aptitude for every sort of manual occupation. It is now

proved that by it, three persons may be fitted to be as effective in ordinary labour as five who are untrained; an economy of force which is of peculiar importance in itself, most especially to these districts, to meet an impending serious scarcity of labour.

Another course for the prompt and salutary reduction of congestions of labour is the removal of such barriers to the circulation of labour, as those created by the law and practice of apprenticeship, in its arbitrary requirement of a seven years' bondage—for it is a slave labour condition, that is, labour without immediate interest in the work, and at the command of another—inducing slavish and slow habits of work in prolonging for years the learning of processes which might be learned in a few months. Of the benefits of the abolition of any fixed or arbitrary contracts of apprenticeship the cotton manufacture is an example.

The first Sir Robert Peel rendered an important indirect service to the cotton manufacture by freeing it from the clog of apprenticeship. The first manufacturers provided themselves with children from the parishes, many of them from the metropolis. Their labour being of the quality of slave labour, *i.e.*, labour without a sufficiently direct interest in the result—coercion by the whip, which might then legally be used, was resorted to, and great cruelties were committed. To prevent these cruelties he got an Act passed to regulate the labour of young persons engaged as apprentices in factories. To avoid the inconveniences of these regulations, manufacturers ceased to take apprentices, and found out that they could get children taught their work in months, or even in weeks, and that they did far better by the direct employment of young persons for wages at piece work immediately proportioned to their increasing skill, than had been done under the system of the old seven years' apprenticeship. It is scarcely conceivable how the manufacture could now be carried on under such an extent of slave labour conditions as the seven years' apprenticeship imposes. The effect of it must have been to increase the expense of production, to diminish consumption, and to lower wages. Freedom to enter occupations is as important as freedom to leave them, for the relief of stagnant and overburthened labour markets. There is now the less pretext for the maintenance of the barriers of long periods of apprenticeship in manufacturing processes, that the increasing sub-division of mechanical and all other sorts of occupations greatly reduces the time required for teaching or learning them. In the old and primitive conditions of the trade of a carpenter, when the

carpenter was called upon to work upon the widest range of objects, from the making of a gate post to the construction of a geometrical staircase, there was a specious ground for requiring a long period for qualifying him for admission to the guild or the craft and mystery of the trade. But now, when a man is often employed in a large town for his whole life, in nothing else but making one sort of object, a door or a window, or flooring boards—and those now by machinery—there is not even seeming justification for the maintenance of the barbarous trades' union protectionism, and barriers to the free circulation of labour. These barriers, for the keeping out of in-comers, keep in those who would be out-goers; and keep them in as redundant hands who have to be maintained out of the trade funds; and hence wages are really, though not nominally, reduced. Instances of the best real progress in wages may be cited from branches of service which are the most free from such a bond, especially in the highest waged districts of North America. I have had heretofore enough to do officially with parish apprenticeships in poor law administration, to be aware that such contracts of service are generally as injurious in practice, as they are vicious in principle. Next to free trade in commodities, perfect free trade in service is of importance to the masses and to the prosperity of the country.

Formerly, as well as recently, foreign manufacturing populations have been subjected to calamities as severe as that to which the operatives of our cotton manufacture have recently been subjected. One instance is so important that I must refer to it. In this country, on the occurrence of the cotton famine, the chief instructional resource was to send the uneducated adult males into schools for book instruction; afterwards, at the suggestion of Mr. Rawlinson, the sanitary engineer, they were taught the use of the spade and set to work on town drainage and other improvements, in which they have proved themselves most apt scholars. In some three months they have not only become good field drainers, but good town drainers, and have learned good artisans' work, and entitled themselves to fair artisans' wages.*

In Flanders, the industry of 250,000 hand-loom weavers

* The fact may, by the way, be commended to the notice of His Royal Highness the Commander-in-Chief, and to the present Secretary of War, on the question of the beneficial occupation of soldiers in time of peace. A notable example of change of occupation was presented at the Royal Dockyards, where ship carpenters became in a few months as good workers in iron for iron ships as regular smiths.

and hand spinners was absolutely destroyed by the competition, chiefly of the English power looms and machine spinning in 1846. At the same time the potato disease destroyed their chief food. The Belgian Government then, at the instance of the Prime Minister, Monsieur Rogier, and with the concurrence of the local authorities, boldly set up schools throughout the country for teaching them new textile processes, embroidery, open muslin work, glove making, artificial flower making, and various new textile arts in silk, linen, and in cotton, and succeeded completely. Workmasters were collected for teaching the new occupations, which, by means of such instruction, were profitably, firmly, and permanently implanted in several cities. The Government did not undertake to manufacture on its own account, and undertook only to aid with loans of capital, and left the rest to contractors, giving only by its officers a general superintendence over the action of the new institution. Elementary book instruction was given on our half-time principle (except that the book instruction, instead of occupying three hours, was accomplished in two hours a day), in the same buildings as the industrial instruction. This combination of mental and bodily, or industrial instruction, was highly prized. When the great body of the displaced workpeople had by this course of industrial teaching been replaced with productive occupations, and the crisis was over, the Government was disposed to regard these industrial schools as temporary, and to discontinue them; but there was so strong and general a local opposition to their discontinuance, in eighty-two or three out of eighty-five communes, that the Government has been compelled to continue them as permanent institutions, not at present for introducing new occupations, but for teaching old ones; and training neglected children of the ragged school class into habits of productive industry. The teaching of the trades, or of the arts, by trained teachers, is far superior to the teaching on the old method of apprenticeship by the master, who is otherwise occupied, and is commonly deficient in teaching skill, and does not know the principles of his art himself. The teaching, besides being better and cheaper, is vastly quicker in combination with the short-time book instruction. I am informed by M. Gare, the Belgian Government Inspector, that the average expense of the instruction given does not exceed 50*f.* or £2 per scholar; the period varies of course with the occupation, from a few weeks to a few months. He finds that to make a complete workman, reading, writing, and arithmetic are necessary. In the schools of industry as

now carried on, a large proportion of the instruction is in the arts of design. The experience of the teaching elementary drawing in the half-time schools in England, where it has been introduced, is that as an instruction to the hand and eye, and an adaptation to manual work of all sorts, it is next in importance to teaching writing. The expense of imparting this industrial qualification does not exceed £1 per head. Important examples of relief by change of the occupation, have been presented, though late and less systematically, in the case of the unemployed ribbon weavers of Coventry, where, I am informed by the mayor, many of them have gone to alpaca weaving, elastic web weaving, and other new kinds of manufactures. If the unemployed gain new permanent employment better than their old one, it is, of course, better for them, but it is also better for the public at large. If, however, they return to their old employment, as many in the cotton districts may be expected to do, and by which under conditions to which I shall hereafter advert most of them will do better for themselves than by emigration, the congestion of labour will have been most healthily relieved for the public. To the extent to which new hands are required for the renewal of old work, opportunities will be given for the application of improved physical and mental training; with the powers and advantages of which, those interested in these districts have yet to make themselves acquainted. Stagnation of labour and service, congestion of labour, idle waiting, pauperism—is disease. The ready conversion and quick circulation of labour is a healthy condition of the body politic, which it is requisite to sustain actively.

It is not my purpose to enter on the subject of the administration of poor-law relief, nor into the contraventions of sound principles of administration which have occurred. I will confine myself to the passing observation, that the common policy of employers in keeping together stocks of hands unemployed, or only in makeshift and unremunerative occupations for long periods of time, generally proves as erroneous on the part of the employers themselves, as it is unjustifiable as respects the ratepayers of other classes, at whose expense it is done. My immediate object is to direct attention to measures which are preventive of the need of poor-law or charitable relief.

Whilst great strides have been made in reducing the cost of manufacturing production, comparatively slow progress has been made in the cost of distribution, either of manufacturing products or of goods. The interests of producers are stronger than they have yet been aware of, in reducing the cost of

distribution to the lowest; as extending consumption, as increasing demand—and with it wages as well as profits—and steadying both. I have not time to advert to the effects of the high cost of the retail distribution of the textile fabrics. But of late there have been reductions in the cost of the distribution of foods, some of the most important, by the wage classes themselves, which are fraught with important lessons as to the practicability and advantage of avoiding the credit system of purchases. It was found that the expense of the retail distribution of flour to domestic consumers was very great; and at Rochdale, and other places, co-operative associations—which were, in fact, joint-stock companies,* —were formed to reduce that expense. By getting at once a large body of consumers for ready money, and by reducing establishment charges, they did, in fact, reduce the cost from some 25 to about 5 per cent. to the consumers. The effect of setting up one co-operative store in Leeds, was to dispense with the services and the expense of some forty sets of retail distributors, or to occasion the shutting up of some forty small retail shops, with forty separate rents, rates and taxes, and credits, by economising and concentrating the labour of distribution in one, and that one for ready money payments. At Halifax 5,000 shareholders or customers have been got together, as we are told, by one association. In Glasgow and Manchester, and elsewhere, manufacturers, by individual enterprise, have effected the distribution of food to the wage-classes, ready cooked, in the establishments well known as workmen's dining-rooms, in which 500 or 1,000 workpeople dine daily, at one establishment; who, I was told, at Manchester, had previously been accustomed to dine at small dining-rooms, where not more than twenty or thirty dined at each place daily. In this instance, as in the case of the co-operative distribution of the uncooked food, the saving was in the reduction of the expenses of the numerous separate small dining

* The new cotton factories which have been called co-operative, and which, under that name, have brought together large numbers of shareholders of the wage classes, are all now in reality common joint-stock companies, with limited liability. The so-called co-operative shareholders in the leading establishments, decided, as I am informed, by large majorities, that the workers should only be paid wages in the ordinary manner, and should not divide profits. The wages being for piece work, it was held that the payment was in accordance with communistic principle, "each according to his capacity, each according to his work." The common spinner had had no share in the work of the general direction, nor had he evinced any of the capacity of thrift or foresight of the capitalist, and why should he share profits as if he had? The wage class, in their capacity of shareholders, decided that it was an unjust claim upon their profits, and kept them undivided to themselves.

establishments by one large one.* Several individual manufacturers, however, have munificently fed their own workpeople, on food purchased for cash, at wholesale prices. From some accounts of the cost of the food so purchased, as also of the previous usual expenditure of the same workpeople, the following most important results, displaying the operation of their improvident credit system, were manifested, namely:—that a given amount of money spent, 1st, as the wage-classes are accustomed to spend it, by purchases on credit at small retail shops, will produce one and a-half day's subsistence; 2ndly, spent at retail shops for ready money, the same amount will produce two days' subsistence; 3rdly, spent on food purchased wholesale for cash, it will produce nearly three days' subsistence. The prime cost of the four-pound loaf baked on a large scale was 4*d.*, at the time the wage-classes were charged 7*d.* and 7½*d.* for the four-pound loaf at the shops; but the loaf produced wholesale was, from its better quality, worth at the least a halfpenny more—and so with the other foods. I have no doubt, speaking generally, that by improvements in saving labour, and losses from the credit system in distribution, full two and a half day's subsistence may be obtained, at the expense which now gives only one and a half day's food for the same money. Strong labouring men who take the whole of their food, breakfast, dinner, and tea or supper there, get as much as satisfies them for 7½*d.* a day, on the average. Call it 5*s.* a week, for a minimum of food for a bare subsistence, or nearly double the amount reported to be expended by agricultural labourers; and in some public institutions where a high degree of health and strength is maintained, the cost is much less. Add to this 2*s.* for lodging, and 2*s.* for washing and clothes, or say 10*s.* a week

* The first observation naturally made upon this statement is, But what will become of the displaced small shopkeepers? to which my answer is, that the results to be anticipated are like those which have followed improvements in machinery. Labour saved, is to be taken as equivalent to capital created, and thence an increased demand for labour. The whole history of Lancashire during the last half century has been one of the extension of labour-saving machines, and, at the same time, of a demand for labour, with a continued augmentation of the population, and an augmentation of the rates of wages. It once certainly appeared to me *à priori* that some very special provision of poor law relief ought to be made for those able-bodied men whose labour had been superseded, and who had been thrown out of work by the introduction of new machinery. Anticipating disastrous results to classes of men, I made inquiry as to the effects of some large displacements of labour, by such means. I found, that after a little time, the people displaced were, as a *class*, with fewer individual exceptions than could have been anticipated, as well off as before, or even better; and, that, as related to such *classes*, the best course was to do nothing.

for the bare necessities, and hence we find that by improvements in distribution how much wider a margin is gained than heretofore, for extra comforts and reserves for insurance, to a factory labourer, who earns 18*s.*, 20*s.* or 25*s.* or more a week.

The wage classes of the cotton manufacture, have, it is said, borne their privations nobly, and I would be far from detracting from their praise; for I well know to how many unfavourable circumstances they have been subjected. But it must be said that if all of them had done what some of them have done; if most of them had not, by neglect, been deprived of the benefits of an education and training of a proper quality, suitable to females as well as to males; and if our recommendations, and the provisions of the Factory Act, had been duly complied with; they would have had far less of those privations to bear at the expense of others, as well as of themselves. In some of the largest of the schools specially established for the instruction of the unemployed workpeople, it was found that more than 75 per cent. of them were unable to read. Not having the faculty to make the most simple calculation, wages and the domestic means are wasted by the credit system; 80 per cent. of these females were found to have no knowledge of any sewing, such as is taught in elementary schools. Some of them "When they first took a needle into their hands, pushed it through their work by pressing it upon the table." "I," says Mr. Redgrave, "saw a mother—who, until she attended a sewing class never used a needle—making a frock for her sixth child." Having no knowledge how to mend clothes, they and their children were in rags. Families trooped into the relief rooms in the most abject condition, whose previous aggregate wages exceeded the income of many curates, as had many of the individual workmen. On the occurrence of absolute destitution, it is the rule of the new poor-law, as well as of common humanity, to regard solely the fact of the destitution, without reference to its cause, for the purpose of relief. But it is now proper to look to the past for the sake of the future, and ask whether serious perturbations of the trade shall entail the like destitution and misery and chargeability *ab extra* for its relief, however high above the average of other districts the future wages may be. It is to be borne in mind, that the past wages have been at the least one-third higher than in the rural districts, and that the average age of death of the operatives in the manufacturing districts, is fully one-third lower. The estimated wages of the 440,000 cotton operatives being in the aggregate 11 millions and a half,—the reserves might on the standard of agricultural expenditure, have been, for one year, for the cotton workers alone, or from year to year, double the amount raised by external charity; nearly as much as the four millions of the deposits of the county savings' banks for many years up to the present time, when they amount only to 31*s.*, whilst in the county of Devon, they are 60*s.* per head of the population. The investments in building clubs and in other directions are no doubt greater in Lancashire, but so far as appears, not commensurate with the difference of the wages in the two districts. One source of the difference is the manifest difference in the rates of expenditure for drinks, and the statistics of drunkenness point to this as a source of the evil against which it behoves all social economists to lend their best exertions; namely, the conditions in which high wages mean only excess in drink. It must be said that in the last famine year there was in Rochdale, Preston, and some other places, a reduction of the evil; but that in Manchester, and other places, there was an increase of it;—that in the famine year nearly 28,000 persons were proceeded against in the whole county for being drunk and disorderly, and that the proportion of offenders was more than double the number of all England and Wales, and five times the number of the county of Devon.* Crime of all sorts follows excess in drinking, and in Lancashire it bears the same relation to the crime in Devonshire as it does to its drunkenness. Educationists regret that the persons of the wage class who give the best attention to the education of their children, and who pay for their schooling the most regularly, are not those of the highest, but those of a medium amount of wages. I have been informed of one man in the vicinity of Manchester, a retailer of coals, who refused to give credit to any man who earned more than 24*s.* per week, because he found from experience that if he did so, he never got paid.

One example of the abatement of the great evil, presented by the Report of M. Reybaud, to the Academy of Moral and Political Sciences in the Institute of France, appears to me to

* These returns do not distinguish the occupations of the offenders, and there is no reason for believing that they belong peculiarly to the cotton workers. Mr. Arthur Arnold, in his very able history of the cotton famine, referring to the extraordinary rise in health of the unemployed, observes, "It was well said by the sexton of one of the most important towns in Lancashire, when asked how it happened that his lugubrious trade was unusually inactive during the summer of the present year. "Well thae sees," he answered, "poverty seldom dees. There's far more kilt wi' o'er heytin' and o'er drinkin' nor there is wi' bein' pinched"—a truth which contains a moral lesson valuable to all classes.

be so important, that it was a strong motive to me to accept the honour of the position now entrusted to me, that I might have an opportunity of calling public attention to it in England.

"For the first time in my travels," says M. Reybaud, "in the town of Sedan, which is an ancient seat of woollen manufacture, I have met with a working population from which habitual drunkenness has been expelled. The chief honour of this achievement is due to the head manufacturers. By an agreement amongst themselves, which ought to be held forth as an example to others in their position, they have shut the doors of their establishments against all workmen given to excess in drink, or who by open and notorious drunkenness signalised themselves for that exclusion. The fight with the vice has been long, and possibly with another population the victory might not have been with sobriety. But at Sedan there has been a complete success. Beginning with the least hardened of the drunkards, it has ended by reforming or shutting out the most obdurate of them. Towards those workmen who, with the best intentions to mend, now and then gave way, some indulgence was at first extended. They were allowed the benefit of continued amendment, and provided it was notorious that there was amendment, and that their offences became less serious as well as less frequent, their presence in the workshops was tolerated; the conditions of their employment being that they made a sincere confession, or that the wife, the party most deeply interested, came and asked pardon for her husband's offence. Amongst other examples of the sort of conflicts which arose, I received the following—that of Father Joseph. Father Joseph was a fuller, an old workman above sixty, when this revolution took place. It attacked him in his most deep-rooted habits and tastes. Working with his feet in water all day, continually wet in the process, he had contracted a horror of water, and at night, when his work was done, he withstood its effects by what he considered the most powerful antidotes. He was an excellent workman, who had many good qualities to set against his one default, for he preferred to drink at home rather than at the cabaret, and at night, when his children were in bed or away, to avoid as much as possible setting them a bad example. His employer took pity on him. To discharge him after his long services seemed an act of barbarity. Nevertheless an agreement had been made by all the manufacturers which must be kept to, which allowed of no exception. The employer sent for the old workman and paid him his wages. Joseph took high ground, declared that this was an attack upon his liberty, that he would sooner be discharged from his work than have his drink interfered with, and that he would take a double quantity that very night to vindicate his independence. After the first storm of anger, reflection and a calm ensued. The word of Father Joseph was as good as his deed. After long objections and debates, and with deep sighs on his part,

the employer got him to agree that, for one whole year to begin with, he would only get drunk on Sundays and Saint's days. The workman reserved to himself the right to drink as he pleased on those days, and it is to be feared that it did please him to take extra doses to compensate himself for his privations during the rest of the week. The year passed, and Joseph had again to appear before his employer, to meet a fresh attack upon his habits. Now, the condition was to be, that for the next year he was only free to get drunk one Sunday in the month. There was a renewed rebellion, renewed debates, followed by renewed submission. The second year passed and the fatal term for the entire discontinuance of the habit arrived. It was now put to him that he must cease to get drunk entirely, or cease to work at his old shop. The remembrance remains of the valiant resistance made by Father Joseph when driven to this last ditch. It was, he said, an attack upon his health; they would deprive him of a tonic, and prevent him taking that care of himself which only a man could take who knew his own temperament. Good workman as he was, notwithstanding his age, he was becoming one of the softest in the shop. No one would gain by that, his employers any more than he. Why not let him continue to live as he had lived? As his work did not suffer from it, why mind an occasional whip up? The habit was reduced to the fairest limits, and he positively had nothing more to concede to these exactions—and so on. During an hour's discussion, Joseph held his ground determinately against the most benevolent persuasions. Then his resistance slackened, and he was about giving way, when a scruple of conscience seized him. Each trade in those districts has its own patron saint, and the woollen workers have perhaps the most accommodating on the calendar. At the decisive moment an idea occurred to Joseph, who set up a cry of distress and of determined resistance. 'Why, you will at least leave me the annual festival of my patron saint?' he exclaimed resolutely to his employers. The employer in his turn gave way, and to secure a complete conversion, the privilege of the annual saint's day was finally yielded to Joseph.

"I cite this anecdote," says M. Reybaud, "because it well displays the manners of the country,—on the side of the workmen, a fidelity to their engagements, even where the acts elude control; an open defence of what they do, instead of underhand evasions; an honest maintenance of what might easily pervert the conscience; on the side of the masters, firmness tempered by indulgence, a determination to abide by an agreement amongst themselves, to do what was good for the workmen with or without their consent; to protect them and their families against vices by which the manual labour of the workshop is not visibly or seriously affected.

"To be convinced of the great results obtained however by the course taken by the employers, it is only necessary to pass in the evening through those parts of Sedan which are thronged by workpeople. You now hear no disturbances, no outcries; you see no

drunkenness except it be amongst the soldiers of the garrison, and you see no open shameless prostitutes. The few cabarets that you meet with are without the glaring exterior displays and provocatives which you may observe in such places elsewhere. They are modest, and seem even careful not to attract attention. Their customers glide in and do not display themselves in front, and the doors, which are carefully shut, conceal what goes on within. If there be debauchery—and there is yet everywhere—it is no longer scandalous and offensive to the public eye. To display it would be to expose it to denunciation as against the rule of the workshop. With all this, there is nothing which has the aspect of constraint; the state of things is conformable to the predominant social sentiment. Temperance has entered into the tastes and habits of the population, and owing to the benefit experienced from it, prevails without constant effort. The wives of the workmen have not been indeed backward in giving support to the movement which so directly affected them, for it put into their hands an arm and a power which they did not neglect to use; for they had much to gain by it;—domestic comfort, a less stormy household, better examples for their children, in a word a home freed from a train of brutalising influences. Hence the exterior tranquillity of the town corresponds with the domestic calm, of which it was but the sign and the fruit. Without the services of a single extra policeman, solely by the effect of more sober habits, the streets of these lower quarters are freed from habitual disorder. The altercations, the assaults, the fights, the crimes which drunkenness multiplies have disappeared amidst the applause of the city and the home. I urge this," he says, "as a great example which bears upon the source of the greatest calamities to which our workpeople are subject, but which, while it is everywhere deplored, has hitherto been nowhere seriously combated by the influential classes above them. Nearly always when action against it is thought of, recourse is had to the law for means of repression by punishment, or by an authoritative police surveillance over the sources of disorder. Nothing is more convenient, but at the same time more ineffectual. It is only by individual effort wisely and firmly directed, that the evil can be abated, as much as it appears to me to be possible to abate it. Here is a city where the leaders of industry have by a rare exception brought themselves to understand each other and act in common; to forget for the time the trade interests by which they are divided, for the sake of a superior interest, a real reform of the vicious habits of the population, on which they have been united. Drunkenness is forbidden, drunkards are excluded from all the great workshops. Why cannot the manufacturers in other cities follow the example? Why cannot they undertake a campaign against habitual drunkenness, such as that which has succeeded at Sedan?

"It is a distinction for Sedan to have acted, while other manufacturing cities have done nothing against the evil. But all that has been done for morals, has not been without profit to the manufacturers; it is well to say to those who are so absorbed by a

seemingly direct and manifest money interest, that the workmen who have become more temperate have become more punctual and trustworthy too, and the moral victory has proved to be a good money calculation."

The courses of action above described are of great importance, for the repression of excess in habits already formed in adult workmen, but other tried measures are also available for the prevention of such habits in the rising generation of workmen who will be in demand for the new labour, and to take the place of the adults who are going. Many of the old mills with old machinery that are now shut up, will not, I am told, be opened again; new mills with new machinery will be opened in their place. They will, therefore, afford opportunities for better economic and social starts, which it is important to consider.

In the first place, these new mills will present a most important example of a large sanitary improvement in places of work evolved by the latest and continuing improvement in production. Under the stimulus of the latest pressure of manufacturing distress, it is found that, as compared with the average machinery of the previous eight or ten years, there may be a saving of ten per cent. in the number of the hands, or between forty and fifty thousand of the late number engaged, if from the reduced price of production there were not an increased demand for produce and labour, which would reabsorb them under the new conditions. The quantity of produce that may be turned off by the machinery under the superintendence of each hand will, by these improvements, be augmented from ten to twenty per cent. per head. To save the expense of construction the roofs of the old mills were commonly made as low as possible, and the crowded rooms are often as difficult to ventilate as the between decks of ships even when the port-holes are opened; but the windows of factories must be kept shut for the sake of the spinning temperature. Hence there is a foul atmosphere for the hands, and an eventual waste of their force. But now, to reduce the expense of labour by reducing the number of the labourers, by extending still further the machinery under one superintendence, the machines must be widened, and the rooms to contain them must be widened too; and the rooms being widened, it is found necessary to elevate the roofs, to obtain the requisite light from the sides to the centres.

An eminent manufacturer writes to me:—"My present mills are 40 and 45 feet wide, with rooms only from 9 feet to 9 feet 6 inches high. The rooms of my new mills are to

be 100 to 120 feet wide, and 14 and 15 feet high." The increased purity of the air, the greatly increased cubic space, and also the increased supply of solar light, will be an immense gain to future workers, who, by a better application of steam power in these new mills, will moreover be relieved of four-fifths of their present amount of physical toil, and be advanced as intelligent directors of the force of a greater quantity of machinery.

These new mills will afford opportunities for new starts, in the economy of the force of the wage classes, by improved habitations. This may be best done when habitations on improved plans are constructed on a large scale, with the advantage of repetitions of parts, for which the large numbers of hands required will afford opportunities.

The workpeople in existing manufactories may be described as industrial regiments; but the larger manufactories demanded by manufacturing and mining will require workpeople in numbers equal to divisions of large armies, of which the leaders of the industry are generals, and the partners or overlookers colonels and officers. One company of machine workers at Oldham has 4,000 men and boys, amongst whom it is stated that £5,000 a week in wages are usually divided.

For the service of the old cotton factories, the workpeople have been brought upon towns, much as regiments would be brought there, if they were without any provision of quarters, and if every soldier was left to provide for himself, anywhere and anyhow; with only the condition of making his appearance at the roll-call, the commandant being meanwhile anxiously occupied in foraging about to raise money for their pay. Men, women, and children, are brought together without any due provision of proper homes or schools. These industrial regiments and brigades have been led into over-crowded fever nests, and then told to find medical service how they can for the alleviation of disease and suffering. At the outset of the cotton and other manufactures, those who began them were generally poor, often themselves of the wage classes, and had quite enough to do to raise capital for their works and to keep them going. They got work-people together how they could. How they were huddled together, in what dwellings, how the wages were spent or mis-spent, was of no more concern to the employer than it usually is to any purchaser how the tradesman disposes of his profits on the sale of his goods. There was little perception of the evils of such disorderly aggregations, little time on the part of the employers to think of them, or skill or capital to apply for their prevention; and there being no public administrative care or responsibility for the protection of the popular interests, or the general public interests, in the health and morality of the population, the deleterious conditions thus commenced have been continued from reckless habits. The operative must live near his work, in any dwelling that he can get and if that which he gets is ill-drained or cesspool-tainted, he must take it and sleep in it with his family, for he can get no other. If it be without proper supplies of water laid on, his wife or he, who have been at work all day, have no time to fetch any, and they get the nearest and the scantiest supply they can, and they and their children go unwashed. Hence commonly the workshop is crowded with habitually unwashed fœtid people, often in ill-ventilated rooms. To work in such atmospheres and sleep in such conditions—the whole family being often huddled together in one sleeping room—is exhaustive to the nervous system, and the exhaustion is provocative to the use of drinks and stimulants. I once remonstrated with an apparently sensible workman, on the expenditure of half his income in whisky; his reply was—"Do you, Sir, come and live here, and you will drink whisky too." There are few, indeed, who would not, who consented to go into such places. Such conditions which provoke excess in drinks on the part of the labouring classes are commonly overlooked, as also the need of the removal of conditions for the prevention of such habits. I know that the same classes when living and working in purer air drink less.

The effects of those conditions are indeed shown on all occasions by a rise in the health of those who are in the open air when out of work. Children are reared in these conditions, and if there were good schools near the place of work or the habitations, they were of no use to the workers, for the children, when of an age to go to them, were required to help and supply the deficiency of wages occasioned by drink. To protect the rising generation from this exclusion from education, and from bodily deterioration by overwork, the compulsory provision of three hours' schooling a day, or the half-school time system, was proposed by myself and my colleagues, and is now at length assented to as a principle, though yet defectively carried out in practice. The condition of manufacturing service, of entire devotion to individual work, and of exhaustion by it, excludes much attention by the individual to many of his personal wants, or to those of his family, and they must be seen to or provided for by some external and independent public authority, by some common or special provision, or they will not be provided at all.

As it would be with soldiers in a garrison, the aggregation of people in factories without due provisions outside the factory, is productive of irregular and inferior service, and frequent unintelligent action within the factory. As, however, manufactures on a larger scale have become more settled and systematised, and the consumption of goods more regular, and as capital has accumulated, many better educated and more liberal capitalists, with leisure to look beyond the walls of their manufactories, have introduced various improvements in the condition of their work-people; some by providing better houses for them, others by providing improved schools for their children; and they have generally found that the improved external conditions, by bringing and keeping a more respectable class of people about them, have been attended by improved internal service in the manufactory. One great firm pays most sedulous attention to its own half-time schools, and will not, if it can possibly avoid, engage any one, even for superior positions, in its service, who has not gone through those schools. Whether it be single capitalists, or associated capitalists, in companies, co-operative or other, who will have to seek and probably to compete for new hands to meet the coming demands for the increased production of manufactured goods, it may be urged upon them that they would themselves do well to make more matured provision for a class of work-people qualified for the better application than heretofore of the same wages, or of the improved wages which it will probably be necessary to give.

Sanitary science and economical science will now enable them to invite new comers by saying to them, "If you join us, you may rely upon having fellow workers of respectable conditions, and of being protected from the annoyance of association with habitual drunkards, or with persons of disreputable conduct, for we permit none such to remain with us. Our place of work is warmed and ventilated on the best principle, and provision is made for the personal cleanliness and comfort of our workpeople. You will have a convenient self-contained house for your wife and family, well drained and ventilated, and provided with pure water, as also with warm water laid on from the condensing water of our works for baths and for washing, with a garden plot attached to it. Our workpeople have a co-operative store of their own, in which you may obtain wholesome food at wholesale prices, by which you will save 20 per cent. on your expenditure for food. Your children will have the advantage of a school under good teachers for physical as well as mental training on the half school-time principle. We have engaged for the protection of the health and working strength of our people, the services of a medical officer of health, less to cure than to prevent disease by seeing to the removal of its causes. If you attend to his suggestions, for yourself and family, whilst using our working and living rooms, you may reduce your sickness and insurance charges more than one-half, and extend the period of your working ability more than ten years beyond the periods obtained in other places. This will enable you, under Mr. Gladstone's Annuity Act, by increased savings, to obtain a deferred annuity, that will give you easy and respectable independence when you are past work. In the ordinary conditions elsewhere, your doom, a premature death, after a wretched life, is certain. In the common conditions, in ill-drained, ill-conditioned, cesspool-tainted houses, without proper supplies of water, for which you will have to pay higher rents in low neighbourhoods, half your children will be in their graves soon after their fifth year, as you may see by the Registrar's returns all workmen's children are in Manchester, in Glasgow, and elsewhere. But here your wife may rear them all, and educate and train them all well, and you may enjoy with her and them the comforts of a cheerful home, to the comforts of which each child as it grows up may, by duly moderated and salutary labour, contribute."

All this the enlightened leader of industry may promise and do, for we may show where one or other portion of the promise is fully performed by the most prosperous firms.

Much of this has indeed been done by public means. Where Lord Shaftesbury's Act for the regulation of the lodgings for tramps or for nightly lodgers has been properly executed, those places have been kept clear of a great part of the diseases which ravage the inmates of the weekly tenements occupied by the wage classes. Instances may be given of the reduction to one-half of the sickness and death-rates prevalent amongst them by house drainage works alone. Mr. Heywood, the Secretary of the Cotton Supply Association, has estimated, by a division of the margin of wages and profits in 1860, that the sum of £80 would be lost to the trade for every working hand that emigrated. It may be objected that if they were kept unemployed or ill-employed in such pauper conditions as many of them have been, the present value of such hands would soon disappear by the deterioration of the quality of the labour. My estimate was higher of the loss incurred for every working hand prematurely lost, as the average loss is ten years at the least of working ability by premature

deaths from preventible causes. Twenty years ago Dr. Lyon Playfair, after examining Lancashire under the Commission of Inquiry into the Health of Towns, concurred with me in the conclusion that at least 14,000 premature lives were sacrificed under preventible conditions in the cotton manufacturing districts, of whom 11,000 were lost in stages of working ability; and that a loss was thereby incurred of not less than four millions annually, a loss exceeding that apprehended in manufacturing interests by emigration. Calamity has certainly been the means of gaining an extent of attention to these means of physical improvement, which the most complete economical expositions hitherto have failed to do. If the million and three-quarters of money lent by Parliament, for the employment of the unemployed cotton operatives, should be wisely expended in putting the habitations of the workers in a proper sanitary condition, and if the experience of the results of proper works should lead to their general application to all places in the manufacturing districts, where such works are needed; if the habitations be put in a condition as homes befitting a better trained and educated population; and if the better training and education of the in-comers be provided by the due application of half-time physical and mental training, then this late and large distress will be attended by adequate compensation in social and moral, as well as in material improvement:—and if the principles of economical and social science which I have indicated in their relation with the means of intellectual, moral, and physical improvement, be duly regarded and applied,—the conditions of the manufacturing population, instead of being deplorable, will with the increased and increasing wages derivable by the people from the extraordinary improvements in the mechanical arts for which they are required as the ministers and servants, be brought up to a high state of moral and social advancement.*

In parting for the present with the great topic of manufacturing economy, I have to state that we have this year made an opening for the consideration of agricultural economy.

Agricultural associations generally confine themselves to the discussions of questions of progress in agricultural art. The discussion of questions of agricultural economy appears to be

* It was found that the further reading of the address would have delayed the business of the Sections, and it was therefore terminated at this point, and the part of the subsequent portion which relates to the application of the piece-work principle was read in the Agricultural Section.

deemed out of place there, even the education of agricultural labourers, which is so important to the progress of agricultural art itself, is little entertained by them. But here, the general survey of the whole field of labour and production will be deficient if the great agricultural portion, from which manufactures draw so largely, be passed without examination or notice. The same economical principles pervade the entire fields, though under varied conditions, which it will be advantageous to both to observe. Extensive land agents and successful land improvers who are conversant with manufacturing economy, are wont to express their wish that land should be taken in hand by men of manufacturing habits, which include the economical principles applied in manufactures. It has been confidently declared to me by practical men that the application of the like principles would be eventually attended by the like wages and profits in agriculture as in manufactures, and I believe it may be made evident that they would. In examining the general condition of agriculture, we cannot fail to be struck with its comparatively slow rate of progress. The principles of the subsoil drainage of land, for example, have been demonstrated in practice for more than a quarter of a century, and I know from official sources, that under all varieties of rude and imperfect work, such drainage repaid itself in from ten to four years—yet of the land requiring drainage, after all that has been said, not more than some fifteenth part has yet been drained. Five years may now be taken as the average period of repayment for proper land drainage works. Manufacturing economy would not linger long in availing itself of such results. In the course of some investigations, to get quickly at the knowledge of the places where drainage works were most neglected, I once asked a candle manufacturer in London from whence the greatest quantity of their rushes were got for rush lights. "From Lancashire and Cheshire," was the answer. That is from the vicinity of the great manufactures. In an agricultural report it was declared not long ago, that two-thirds of Cheshire was too wet to bear sheep. Land drainage ought indeed to be pointed out as a great field of most salutary and suitable work for the employment of the unemployed in the cotton districts. In the rural villages, old men and women, bent and withered with rheumatism from working in wet fields and living in damp cottages, are considered regular subjects for the exercise of artistic skill and sympathy. Let me cite a description I gave in 1842 of the conditions requiring the application of economic as well as sanitary principles:—

"Within many of the towns we find the houses and streets filthy, the air fœtid; disease—typhus, and other epidemics—rife amongst the population, bringing in their train destitution, and the need of pecuniary as well as medical relief; all mainly arising from the presence of the richest materials of production, the complete absence of which, would, in a great measure, restore health, avert the recurrence of disease, and, if properly applied, would promote abundance, cheapen food, and increase the demand for beneficial labour. Outside the afflicted districts, and at a short distance from them, as in the adjacent rural districts, we find the aspect of the country poor, and thinly clad with vegetation (except rushes and plants favoured by a superabundance of moisture), the crops meagre, the labouring agricultural population afflicted with rheumatism and other maladies arising from damp and an excess of water, which, if removed, would relieve them from a cause of disease, and the land from an impediment to production, and if conveyed for the use of the town population, would give that population the element of which they stand in peculiar need as a means to relieve them from that which is their own cause of depression, and return it for use on other land as a means of the highest fertility. The fact of the existence of these evils, and that they are removable, is not more certain than that their removal would be attended by reductions of existing burdens, and might be rendered productive of general advantage, if due means, guided by science, and applied by properly qualified officers, be resorted to."

The pressure of distress from the cotton famine will at length have gained attention to one portion of this topic, and, so far as the clearance of the towns is concerned, the advice of one properly qualified, Mr. Robert Rawlinson, has certainly at last in this year 1864, been resorted to in Lancashire. An outcry has recently been raised, founded upon official medical examination by Dr. Edward Smith, on the great need of milk for the use of the town population, and especially for children. In that same report of 1842, I stated, that with reference to the sewerage of the metropolis—which was then equivalent in population to that of all Lancashire—that taking the rate of production even from the wasteful method of applying the sewerage of Edinburgh, by submersion, the refuse now thrown away would serve to feed no less than 218,000 cows annually. If the more economical method of applying liquid manure, pointed out in the official minutes of information which I was enabled to prepare in 1851, and which were laid before Parliament in 1852, by which a quantity of water or liquid manure equal to a heavy thunder-shower, may be thrown on any sort of culture at a rate of a shilling an application per acre, and the formation of sewer marsh surfaces be avoided—a double production would be obtained.

Added to the immense waste of the town manures, there is a general waste (an increasing number of model farms excepted), of all the liquid farm-yard manures, as well as of two-thirds of the effect of all the solid farm-yard manures (as demonstrated in the minutes to which I have referred), from their application in defective methods. This general waste of the farm-yard manures has been estimated by good agriculturalists as equivalent in itself to another rental of the land.

Such are the present common conditions of the fields of agriculture, besides those of manufactures, for the application of economical principles. One of the available principles which I have not time to demonstrate at length, is that which I call of *in*tensive as compared with *ex*tensive production, of the heaviest amount of produce from high culture on narrow areas of land as against thin production from low culture on wide areas. Mr. Lecouteux corroborated this, in his "*Principes de la culture ameliorante*," that by applying different doses of manures in the proportion of nine, of fourteen, and of twenty—respectively to the same areas of land, the prime cost of raising a quarter of wheat was brought down from 40*s.* to 32*s.*, and from 32*s.* to 17*s.* per quarter, rent included. Now this reduction in price was gained by the adoption of the economical principle, the operation of which I have already described in manufactures, namely, of distributing the fixed establishment charges over the greatest amount of gross produce. Thus, if the acre which only produced twenty bushels hitherto, is made to produce forty, the double quantity will only have half the fixed charges upon it of rent, rates, roads, hedges, buildings, &c. But the greatest economical result to be looked forward to in agriculture, is in the increase in the "intelligent force" applied to it. The striking advance of the cotton manufacture is, certainly, due mainly to the great bulk of the labour being on the piece-work principle, and to the ease with which it is applied. Cotton manufactures could not, indeed, be worked as farms are, by day work. An instance has recently been mentioned to me of a family of agricultural labourers who had become mill workers, and, of course, trained in piece-work; but having been thrown out of employment during the late famine, had offered to, and had been engaged to do agricultural work, such as getting off crops, as piece-work, at less than would have been paid for day work to attain the same object, and were believed to have paid themselves well. I have been informed of other instances of the same sort. Agricultural labourers also, who have joined gangs of navvies, and have been drilled with them into their energetic piece-work habits, on returning to farm labour, will do their tasks of

work in half the time of the common day labourers. Examples of the highest order of agricultural piece-work, with increased wages, closely approaching to manufacturing wages, are presented in market garden culture, near the metropolis.

In some of the northern agricultural districts, the agricultural labourer's wages are about one-third higher than those in the southern counties; but I have ascertained that their labour, too, is full one-third more efficient; in fact, that two of these northern labourers are equal to three of the south. There are great economical results derived from the saving of one capital, as we may economically designate a man, out of three for the attainment of the same produce. The saving of the food, clothing, and lodging of one out of three, enables the produce to be divided between the two as extra wages, with some increase of profit to their employer. A great economical and social improvement would be consequent on emigration or migration, if farmers could be got to apply the piece-work principle in each case of the departure of one labourer by saying to two others: "Now, Brown is going, and I propose to put you two, Jones and Robinson, chiefly on task work, and divide his wages of nine shillings a week between you, if you will make it worth my while by also dividing his work, and doing it well between you." This, with the younger workers, would meet with a hearty response. The farmer might indeed commonly attain the result gained by manufacturers, in periods of distress, by saying to Jones and Robinson, "If I give you some extra wages, cannot you make it worth my while to do without Brown?" This is a topic for a large economical exposition. Recently in France, at the model farm for the trial of sewage manure, at Voujours, near Paris, I had the advantage of a discussion upon it with the director of the farm, Professor Moll, the most eminent scientific agriculturalist perhaps in Europe, and also with Mr. Amerfoordt, the Mayor of Haarlem, who conducts the chief model farm in Holland. It was declared by Professor Moll that economical progress in agriculture was only practicable on the piece-work principle. Mr. Amerfoordt concurred, and he gave me the following examples of payments for results, in addition to ordinary wages, which he assured me were working exceedingly well:—The steam-plough is introduced in the model farm, and over and above the regular wages a certain extra payment is made for each hectare which is pronounced to be well ploughed; the payment being divided between the engineman and ploughman and boys in attendance. The horse-keeper, over and above his fixed wages, has a payment for each living foal got from a mare;—the cowkeeper has an extra allowance for each living calf got;—the shepherd an extra allowance for each lamb sold, or living six weeks after it is born;—the poultry keeper an extra allowance upon each hundred eggs delivered to the housekeeper, and upon each cock or hen sold;—and the dairymaid an extra allowance for each lot of butter and cheese sold, without reasonable objection to its quality from the purchaser. On this particular farm the cereals are at once worked up into bread for sale. The baker on the establishment has a fixed wage allowance, for which, however, he must sell not less than a given quantity of bread. For all he sells above a given quantity he has a per-centage. Fines for irregularities, coming late, neglecting horses, are put into a common fund, which is every quarter divided equally amongst all the men, so that the punctual and diligent have an interest in looking after the laggards.

In England a great obstacle to the application of the piece-work principle, is the low state of the education of the farmers, a larger proportion of whom than might be supposed, are incapable of keeping accounts, or even of reading or writing. The principle of paying for results, has been applied to agriculture in Scotland in the payment of shepherds. In England there has, I am told, been a glimpse of the principle in one district, gained by game preservers, who find it to their interest to make it the interest of farmers to be preservers too, in paying them per covey of partridges preserved on their farms.

This system, I am assured, works at Haarlem and elsewhere, as persons conversant with manufactures would expect it to work. The heavy stolid agricultual action is replaced by a vivacious outlook and intelligence. The food manufacturer is saved the labour and distraction of superintendence and incessant fault-finding for carelessness. With us the benighted law of partnership would prevent the baker and other servants being made responsible for losses as well as shares in the profit, making them partners, and rendering the employer liable in his whole property for the defaults of each. The amendment of this law would be of especial importance for the gentleman farmers and land improvers, who cannot give that laborious attention to details, and to checking piece-work, on which agricultural success mainly depends, and who must be dependent on farm bailiffs and stewards. The Association would render much service to agriculture as well as to trade by agitating to free it from such injurious restraints, and advance the great social and administrative problem of making interest coincident with duty.

The increasing emigration to America from Ireland, and the continued flow to our colonies from England, and the

demands from the general labour market in towns, have begun to render labour scarce in agriculture in some districts, and under the pressure of inconvenience or distress from that scarcity, to extend the use of labour saving machines. Steam ploughing has fairly "turned the corner of profit." The demand for "intelligent force" promises to be accompanied by larger demands for "intelligent directors of force." Hitherto there has been as much successful labour saving machinery unused in the agricultural districts, as there is of such machinery used, and mechanical force unused is unused from the want of intelligent directors of it. Even in manufactures intelligence is scarce and deficient for the direction of steam force. Mr. Fairbairn showed some time ago, that as much power was obtained from one pound of coal in Cornwall, where the working of the steam engines is chiefly on the piece-work principle, as in Manchester from five. Improvements have since been made, but the smoke is the outward and visible sign of wasteful work. An intelligent engineman will work a locomotive with half the coal used by one who is unintelligent. In one instance, where the enginemen were put upon piece-work principle, that is, were paid for the amount of power they obtained out of a given quantity of coal, the reduction of the consumption of coal was from thirty down to seventeen. But, in general, employers are not at the pains to get registries or to attend to them. The application of the piece-work principle would reduce the general consumption of coal enormously. Where the causes of steam boiler explosions are ascertained, they are generally found to have been the result of unintelligent direction. Mr. Fairbairn has long urged the necessity of an augmentation of the intelligence, for the direction of force, by improved elementary instruction. If the want of intelligent direction for force be great for manufactures, it is still greater for agriculture. It is well known that steam engines scarcely ever do the duty in the farm-yard that they do in the yard of the maker. I have been informed by a firm which lets out steam power for agriculture, that it is always conditional that they send men whom they know, and can make responsible for the working of their engines, for they cannot trust their engines in such hands as are at present to be got amongst farm servants.

To obtain more intelligent forces and directors of force needed for agriculture, it will be requisite to provide suitably for them in respect to habitations. At present in England, from the distances of the labourers' habitations from the farms, it often happens that a large proportion of the labourer's force is used up in walking to and from the field where he is to

apply it. His force and that of his family is further wasted by the disease consequent on overcrowding, and by the inferior sanitary condition of his dwelling. In agriculture as in manufactures, it will be found to pay to have improved habitations in connection with places of work, not indeed in direct rent, any more than farm-houses pay in direct rent apart from the land, but as practical additions to wages, and as means of obtaining and keeping a respectable, intelligent, and steady description of labourers.

The economical principles which I have indicated as evolved by the progress of machinery in manufactures, may be expected to be attendant on the extended use of machinery in agriculture. On impartial examination, on economical grounds, it will, I conceive, be found, that the fitting intelligence needed to be combined with productive manual force, as well as to direct mechanical force needed in agriculture as well as in manufactures, must be obtained by improved elementary instruction in the school-room, combined with the interest which stimulates intelligence on the half-school time principle in agriculture. Parents of the wage classes on the one side, and employers on the other, have to be informed that by proper training the value of the young, as intelligent force, may be augmented by at least one-fifth, and as "intelligent directors of force" by more than one-third.

If the advanced economical principles deducible from the progress of production in manufactures, be applied to an improved production in agriculture, as by the reduction of establishment charges, by high cultivation and the extended use of labour-saving machines, whilst as in manufactures production will be increased, prices to the consumers will be reduced, wages will be advanced, and the net profits of the capital will be augmented. The concurrent advance of agricultural as well as manufacturing production will be attended on the one hand by improved demands and on the other by improved supplies, between more intelligent populations, and mutual physical, moral, and social elevation.