Address of Edwin Chadwick, Esq., C.B., as vice president of the Public Health Section to the General Meeting of the National Association for the Promotion of Social Science, Glasgow, September 29th, 1860.

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OF

EDWIN CHADWICK, ESQ., C.B.,

AS VICE PRESIDENT OF

THE PUBLIC HEALTH SECTION

TO THE

GENERAL MEETING OF THE NATIONAL ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE.

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ADDRESS

BY

EDWIN CHADWICK, ESQ., C.B.,

ON PUBLIC HEALTH.

THOSE who are conversant with our proceedings in sanitary reform will regret the absence of the president, Lord Ebrington; for valuable would have been the high and impartial testimony he would have borne to it after years of labour for its promotion; but all who learn it for the first time will deeply lament the real cause of that absence—the ill-health occasioned by a grievous injury sustained in the course of efforts made by him for the relief of the suffering. Bravery in military service is worthy of admiration, though it is common with our population. But public recognition is yet due to the bravery in medical and sanitary service, which calmly, and without the excitement of battle or surrounding attention, without the stern commands of military discipline, walks alone into the dark places of our towns, into the midst of an invading pestilence,—which faces the agonies of disease and death in overcrowded habitations, or in the foul wards of hospitals; which encounters severe epidemic visitations, when there is often a positively larger proportion of killed and wounded amongst the medical officers engaged than from battle. On such occasions it has heretofore been my duty, with my colleagues, to give orders directing the services of medical and sanitary officers to positions of severe attack as dangerous as forlorn hopes, but to which—having made their wills, and well knowing the danger—they went courageously and calmly. In particular instances each third officer fell, and all were wounded, that is to say, all were attacked with the prevalent disease in a manner which weakened and crippled the survivor for life. On late occasions we have had noble volunteers of both sexes engaged in dangerous medical and sanitary service, and one illustrious lady, Miss Nightingale, lies dangerously wounded, for whose recovery the privates of the army have, with proper feeling, requested the regimental chaplains to put up prayers.

The noble lord,—who has always been ready to lead and expose himself where misery was to be alleviated,—hearing of the sufferings of soldiers in a military hospital, determined to go and see for himself what relief might be given, and he went into the foul ward of ophthalmic cases;—he was himself attacked with the disease, which has permanently injured his eyesight, and so severely affected his health as to give a grievous check to his bright career. The Association will no doubt pay the tribute of its sympathy and admiration for his gallant devotion to the cause of suffering humanity.

I now beg leave to submit some important questions, as they appear to me, of large imperial policy, which at this time concern the improvement of the physical strength and aptitudes, mental as well as moral, of the population, and of the saving which may be achieved by sanitary measures, of the many thousands who, by proved preventible causes, are now annually slaughtered. These questions may, I submit, be fittingly considered in this city, whose rate of increase in commercial and manufacturing prosperity, and in population, has been, I believe, the most rapid of any community in the empire.

Great Britain, having regard to her acknowledged position and destinies, and the qualities of the labour and service required to fulfil them, is at this time actually getting more and more underpeopled, even at her present rate of increasing population. Industrial demands, of external as well as of internal enterprise, are now checked for want of available labouring hands of the qualities of those by which, under competent directing heads, her present industrial position has been achieved. The primary qualities of those whom we are accustomed to call Anglo-Saxons, including the Lowland Scotch, are, great bodily strength, applied under the command of a steady, persevering will, mental self-contentedness, impassibility to external irrelevant impressions, which carries them through the continued repetition of toilsome labour—"steady as time." To the British workman, work is a serious thing, and it is a serious and a great thing. Negatively, in what it excludes, as well as what it ensures, —good work—it is a great virtue. In every day life it ensures truthfulness—getting work done in time, and according to order; it excludes lying excuses, cheating, and the necessity for excessive labour of superintendence; it excludes frauds and evasions of obligations, to obtain without labour the produce of other people's labour. It excludes shams. Persistent labour, impassivity to the attractions of idleness and pleasurable excitement, excludes vagabondage. I have been in a position to obtain the impartial testimony of foreign employers to the superior efficiency of the British labourers,—that two British labourers do as much work as three modern Normans, or three modern Norwegians, or three modern Danes. Our sanitary engineer, Mr. Rawlinson, who directed works in the Crimea, avers that it would have been economical to have exported British labourers, at 5*s.* a day, to have performed the work done by the Easterns at less than one-fifth that rate of wages; and British

engineers who have conducted works in other parts of the world give similar testimony. The qualities which take the lead in mining and tunnelling, take the lead in penetrating forests and clearances for colonisation. Volney and other French witnesses acknowledge the superiority of the Anglo-Saxon in this respect. The foremost labour of every kind and degree, mental as well as manual, which has supplied the waste of life and energy in our towns, has been sustained by superior physical stamina, derived from those comparatively good sanitary conditions, enjoyed for generations in rural districts, which we wish to give to towns—pure air, pure water, pure and abundant food. Now, the drain upon this description of labour has been, and is, such as to weaken our defences more seriously than we have been disposed to admit. At this time, when the improvement in the implements of war requires an improved quality of hands to wield them,—though the condition of the sailor in the Royal Navy has undergone great improvement, as denoted by the death rate, which, the deaths from violence included, is little more than one-third that of the mercantile marine,—yet it has been a complaint of many of the commanders that the hands they now obtain, and these with difficulty, are often the very refuse of the ports. The extent of the fraudulent obtainment of bounties, and subsequent desertions, is an enormous evil. But it seems to be overlooked, that the demand for our mercantile marine, which exceeds that of all the civilized world put together, except the United States (and our seamen largely supply that too, as well as their ships of war), exceeds the supply, and recourse has often been had to foreign seamen of inferior quality to work our own ships. The hill districts, which formerly "grew Guardsmen," where the sons of small farmers, who had no capital, preferred enlistment to the wages of a shilling a day as agricultural labourers, are now reported to be almost fruitless as enlisting grounds; but Army Commissioners appear to be uninformed of the fact that the same men have now the inducement of wages of several shillings a day, as navvies; and that there is an army of 100,000 men of the quality which heretofore supplied the Guards, chiefly got from these now almost barren enlistment fields, engaged in the work of new construction—abroad as well as at home; and there is another army, of upwards of 120,000 men, engaged in working the new modes of conveyance. Our straits for men were discreditably displayed before Europe in the efforts to obtain inferior mercenary aid, and in our embroilment with the United States, on account of the efforts of indiscreet recruiting agents to get a few companies from thence, by irregular means; and the effect is visible in the ranks of the Guards, in the lower and irregular stature of the new force—the substitutes of the old Guards, lost, against warning, by insanitary conditions and commands, in the Crimea. Our great battles have heretofore been gained by armies of the class of yeomen against the inferior refuse of other nations. But whilst the composition of the ranks of other nations has been improved by education and physical training, and by levies from the middle classes, our army of the line has been

deteriorating. The professional complaints of the deterioration are loud—take the following from the *United Service Journal* of July last:—"The army, as a service, even with limited enlistment in its favour, has not become more popular, nor has a better class of men been induced to join it. On the contrary, in both these respects, it has decidedly fallen off. It is no easy matter, if any pressure prevails, to get a sufficiency of men to enlist at all; and every one who knows anything about it will say that our soldiers are far more than they ever were the very scum and dregs of the population. Ticket-of-leave men abound amongst them. One-half of the recruits raised are practised rogues and vagabonds; they only enlist for the purpose of getting the bounty, and deserting immediately after. The numbers who are said to have done so, upon the authority of the official documents, during the past year, were no less than between 20,000 and 30,000." The inferior quality of the hands obtainable in both branches of the service is denoted by the retention of the use of the lash, which, with a class that had kept pace with the progress of society, would have been as little needed as it is amongst the better educated non-commissioned officers. But for the noble volunteer movement, the position of the country for defence was, undoubtedly, one of serious danger. Then there is a new drain, with which I have myself something to do, for an army of 23,000 men, of more than the pay and qualifications of those which heretofore found place as non-commissioned officers of the army. I am not enabled to state what may have been the difficulty in the composition of the new county police force, but I believe it has not always satisfied the officers; and I know that the quality of the supply to the metropolitan police force has been matter of complaint. Added to these there is the great, and, in some respects, salutary, drain for our colonies of an annual swarming off of numbers equalling that of the whole populations of ancient states—more than that of Athens in its most flourishing condition—comprising much of the best adult labour of the country, whose right place would, under good sanitary conditions, be at home. The drain of adult males, by emigration or by town demands for labour, has produced in some parts of Scotland extraordinary and perplexing disproportion of the sexes. In some parts, I am assured, that by the emigration of the men the whole of the "men's work" is now left to be performed by females.

Now that the Atlantic is being bridged over, the dollar a day and cheap food, and open space in the United States are so far draining away the population of Ireland, in spite of the exertions of the Roman Catholic priesthood to keep up their flocks, that we may be prepared to expect the position of the Protestants will be found, on taking the next census, to have been altered to an extent for which few are prepared. This drain on the rude labour of Great Britain has been already felt in the agricultural districts, and will be more severely so. In the manufacturing districts, certainly, and, I believe, the mining districts, extensions of establishments and entirely new establishments are standing still for want of hands of the right

quality, and the increasing demand for the labour of children is everywhere felt as a most grievous barrier to what is deemed a right education.

These are large facts, on which it behoves us to ponder, for the future of the country. Notwithstanding the positive general rate of increase of the population, notwithstanding the existence of congestions of untrained and ill-trained, unfit and redundant, and mendicant and pauper populations on particular points,—wide examination, and, indeed, the immediate experience of a number of extensive employers of labour in such centres of industry as this, will sustain the large premiss, which I submit—that Great Britain is getting, relatively to the future demands of service and labour of the requisite physical stamina and mental quality—more and more underpeopled. The important conclusion, I submit, from this premiss is, that it behoves all civic communities, such as this, especially, to take measures to arrest the insanitary conditions which annually slaughter full two hundred thousand persons by preventible disease, and which more and more deteriorate, in spite of all manufacturing and commercial and general prosperity, the physical, and thence the mental and moral condition of the population who survive.

It is not because wages are augmenting,—or with the view to countenance any notion that the increase of wages should be checked, that I present these considerations for saving, and thereby increasing the population. On the contrary, I think it well for the advance of machinery and the arts, as also for the good of the people themselves, that wages should be advanced. I have elsewhere shown that there are conditions inherent to advances of the arts of production and improvements in machinery exemplified in Glasgow itself, which require advanced rates of wages, independently of the ordinary economical principles of supply and demand. With an immense increase of population and machinery in Lancashire, wages have more than doubled since the beginning of the century. And this increase of wages, with the advance of the productive arts, will, I hope, occasion labour to be better economised, and life and productive labour to be better cared for.

The death rate in Great Britain may be stated, in round numbers, at half a million annually. On an analysis of the causes of death, it is declared, that one-half may be prevented, and that too by rudimentary, but tried and well-ascertained means. In old dwellings, the death rate has been reduced, from fluctuations of from 30 to 40 to fluctuations of from 13 to 20 per 1000; and to 13 and 15 per 1000, from 28 per 1000; to 16, from 26 to 17. In particular districts, by one measure alone—by an improved supply of water carried into houses, and by improved drainage within the houses, abolishing the middensteads, cesspools, &c., and substituting a water-closet apparatus, the death rate has been reduced by one-third; that is to say, it has been made as if each third year there were a jubilee, in which there were no deaths and no sickness. I have an instance where, in an agricultural district, and with labourers alone, by care, the death rate has been reduced to less

than one-half, or within 12 in 1000. From common lodging houses, by the enforcement, through the police, of sanitary regulations, typhus and diarrhœa, as epidemics prevalent amongst the houses of the labouring classes, are banished. In our well-regulated district institutions for pauper children, those epidemic visitations which ravage the children of the families of working men are almost unknown, and the death rate is reduced to one-third of that prevailing amongst them. There are instances in proof of the assertion that it is possible to give the sanitary advantage to an urban over a rural district. Thus, Dr. Buchanan, the officer of health of St. Giles's district, one of the worst in the metropolis, speaking of one of the sub-districts there, states : "This neighbourhood has had for the last three years an average mortality of 13·6 only per 1000. It is assumed by sanitary statisticians that 17 per 1000 is the inevitable death rate of a town population. Surely the standard is fixed too high, if a mixed community of nearly 4000 persons in the centre of London incur no higher mortality than 13½ per thousand." In this I fully agree with him. As an earnest of what may be done by sanitary measures, I may state, that whereas formerly the general death rate in the army at home was 17·5 per 1000 per annum; in consequence of the labours of Miss Nightingale and others, such advances have been made in the application of sanitary science, that the mortality at Aldershott and Shorncliffe has been, on a three years' average, reduced to 4·7 per thousand. This death rate realizes what I stated in my Report, in 1842, on the Sanitary Condition of the Labouring Population, that by a moderate application of the rudiments of sanitary science, soldiers in camps might be placed in higher sanitary conditions than those yet obtained by civic populations. And here they are so; for the death rate, obtained in the camp, is only one-half of that of artisans of the same ages, in towns not in the worst sanitary conditions. If we call the difference between this improved death rate in the camp and the old rate, 12 per 1000, this, in an army of 80,000 men, amounts to a saving of 960 men, or an entire regiment per annum, and the saving of three regiments and more kept constantly sick and helpless in the hospitals, instead of in health and force for the field. We have as yet no data from India; but, if the Army Commission shall have done its duty, and if a reduction be made in the army mortality from 70 to 30 per annum only, we would save, on a force of 80,000 men, 3,200 recruits per annum.

After all, however, some of the best sanitary standards of what may be done by comparatively inferior means, are the best constructed and best administered prisons in towns, where amongst those prisoners who enter in a fair average state of health there is almost an entire impunity from spontaneous disease, and a higher state of health is obtained than amongst equal numbers of town populations of the same ages of almost any condition of life out of prison. If, for example, the Guards, amongst whom there was a death rate of 21 in 1000, could have been put into one of the best town prisons, though they were "massed together" in as small a superficial area as most town popu-

lations, their death rate would be reduced to 4, and in some places to 2½ per 1000, and their sickness in proportion, as is stated to be the case with soldiers when sent into the Irish prisons, where they have no longer meat rations. The highest hope, at present, of the sanitary reformer, would be realized if he could induce the House of Commons to take the same concern for the sanitary condition of working and honest labourers and their families, to insist upon their habitations being cleared of the taint of the middenstead and the cesspool, and supplied with pure water, and protected from overcrowding, as is the prisoner's cell. This can only be done properly by public means. By the breaking of a drain a short time ago, the water which supplied the prisoners of the Salford prison was polluted with such matter as that which is frequently allowed to pollute the sources of the water supply of populations, and a dysenteric attack was occasioned amongst the prisoners, though no death. There was a public sensation created by the extraordinary event, and an inquiry into the cause. But within the same registration district there passed without notice in the year 1856, 248 deaths from diarrhœa in the sub-district of Salford; and 472 in Manchester amongst the general population, ascribed, in Dr. Greenhow's recent Report, to "the monster sanitary defect" of that city—"the effluvia of middensteads"—from which the prisoners are protected. The efficiency of the protection, by the removal of the cesspool taint from the dwelling, is proved by the ordinary health of the prisoners in that prison—though a large proportion of them are brought in sick, and the site of the prison is washed by a river which, by local neglect, has been converted into an offensive sewer—as compared with the health of factory operatives of the same ages. The following is a statistical table which I obtained in relation to this same prison and district :—

Average Annual Sickness in Days and Decimals.

Ages.	Amongst Factory Operatives.	Amongst the Prisoners in Salford Prison.
16 to 21	4·42	3·10
21 to 26	4·91	1·64
26 to 31	6·88	2·72
31 to 36	3·85	2·63
36 to 41	4·13	·85
41 to 46	5·09	·51

So certain will the chief sanitary data now be found when competently examined, as to enable a contractor to contract for the attainment of given sanitary results; and he ought, with the requisite powers, to contract for the attainment of given ends. He ought to contract for the reduction of the sickness and death rate of such a city as Glasgow by at least one-third, at an expense of about one penny a week per head of the entire population;—a charge less than the insurance charge for the alleviation of the present excess of sickness and mortality. If the expense of cleansing, and other expenses attendant upon the poison pits—the cesspools—were capitalised in

such cities as this and Liverpool and Manchester, I might, within those annual expenses, guarantee the entire removal of those insanitary conditions.

The course which I have now to submit as most urgently required by the present demands for labour and service to be improved in quality, as well as increased in amount, is, first, to arrest the great infantile slaughter from preventible causes in towns; and next, to improve the physical, and thence the moral training of all the children, especially the children of the labouring classes.

The treatment of children, a real public concern for their welfare, is in itself a high test of the moral and social condition of a city, of a nation, of an age, as well as of a family. An infantile death rate, that is to say, of children within the year of their birth, I have always held to be the best single test of the sanitary condition of a place or of a population, as that test is the least affected by occupation, or by immigration or migration, and as children are the most affected by aerial impurity. In answer to applications from medical men, and others engaged in sanitary commissions of inquiry, for instructions as to how they were to proceed in the absence of a proper death registration, or other ready means for getting at the worst conditioned places in towns, I may state—for the information of foreign investigators—that I was wont to say, "Go into the schools for children of the poorest classes. Divide the children there into two groups—of the least and the most squalid and unhealthy looking. Inquire where the most unhealthy live; or get out a list, forming a class of those who have been the most frequently absent on account of sickness; visit their homes, and, though you will meet individual exceptions, you will generally find the class living under the worst localising causes of disease." I remember Dr. Lyon Playfair telling me that, in the first school to which he went with a colleague under the Commission of Inquiry into the Health of Towns, they found two children, with faces blotched by eruptive disease, and on visiting their home they were found to be resident at the confluence of two bad sewers, from which there was an opening. The most frequently absent on account of sickness, were found to be the children resident in cellar dwellings.

One pernicious effect of the present uncertainty of infantile life consequent on the insanitary condition of the dwellings of the labouring classes, (and indeed of the lower middle classes too,) and of the consequent excessive misery and anxieties encountered in rearing children, the uncertainty of rearing them after all, together with the uncertainties of the parents' own lives, is to render the marriage of the most prudent and competent, as heads of families,—improvident. At this time, too, the operation of these insanitary conditions of the town habitations of the labouring classes, is almost to compel the celibacy, or to drive away as emigrants, large numbers of the best description of persons, whose place and labour would otherwise be more suitable in the advancement of the arts at home, than in the rough work of backwoodsmen in new settlements.

Take the case of a respectable young man, of the class to which I have referred as the real stamina of the country, bred up in such tolerably good sanitary conditions as may now be found—a small farmer's son, or an artisan from a rural district disposed to marry, but compelled to seek work in one of our manufacturing towns. What is the condition in which he will find he must live? He will have little choice of the site of his habitation, for it must be near his place of work; or of the condition of the habitation itself, for they are all much alike. In the majority of cases it is unprovided with proper supplies of pure water, which is the default of public administration. There are no means for the removal of foul refuse from the site of the house before it enters into a state of noxious decomposition. The water supplied by the stand-pipes may be pure enough; but having to be kept standing in a room, it rapidly absorbs foul emanations. Typhus, gaol fevers, ship fevers, like the house fevers, were formerly ascribed to contagion,—but this is not the case with dysentery: and 23,000 persons, men, women, and children, were during the last year shown to have died in England and Wales by diarrhœal disease alone. Renewed investigation carried on in the chief manufacturing towns, Manchester, Leeds, Nottingham, officially ascribes this mortality "to the tainting of the atmosphere with the products of organic decomposition, especially of human excrement;" which means that it is the work of the cesspool or the middenstead; "or the habitual drinking of impure water." If the country-bred immigrant have a brother or sister in the town, he will find that their children have no place to play in except the front of the house in a narrow court, frequently unpaved, generally filthy, and in a condition which renders cleanliness of person or clothes often impossible. If he visit relations or friends who have lived long under these conditions, he will find them and their children commonly pale and squalid; in two cases out of three heaped together in a single room; he will learn of the older immigrant families, that of all their children born, more than one-half were in their graves before the end of their fifth year; he will see that those who escaped, and arrive at the adult stage, are pale, stunted, and shorter than their country-born friends. If the immigrant be himself cleanly in clothes and person, that cleanliness he would find, in too many of the manufactories, to be an invidious distinction from the other workmen, which must soon give way amidst the dirt, dust, soot, and insanitary conditions under which he is placed.

In perambulations of the lower districts of towns, you every now and then, in an unpaved, ill-cleansed, and filthy street, are surprised to see whitened stone steps to a labourer's dwelling. Those almost invariably denote the first persistent cleanliness of a new comer, a young rural Anglo-Saxon housewife, which, though valiantly maintained for a time, is eventually borne down by the surrounding filth. The daily cleanliness of person and clothes of a child sent to the majority of schools for the children of the working classes, would generally, too,

be an invidious distinction; yet such cleanliness is a primary sanitary and, indeed, an economical as well as a moral condition.

For the aspect of the town dwellings to the new comer, let me cite the following description, as an example of others. It is by Mr. W. Rendle, the former health-officer of a district in the metropolis, where commercial and manufacturing prosperity is great, and wages are perhaps as high as in any other:—"Can we really hope to Christianize, that is, to moralize people, adults or children, who are constantly surrounded by degradation and filth? As for ourselves, we dare not ignore it; what we do or leave undone will surely affect our future as well as our present well-being. Let us picture to ourselves the man of the alley come home from his work. The house is filthy, the look of it is dingy and repulsive, the air is close and depressive; he is thirsty; the water-butt, decayed and lined with disgusting green vegetation, stands open nigh a drain, and foul liquids, which cannot run off, are about it, tainting it with an unwholesome and unpleasant taste; the refuse heap, with decaying vegetable matter, is near, and the dilapidated privy and cesspool send up heavy poisonous and depressing gases. Such are the homes, may I say, of thousands in this parish. Now, contrast with this that which is near to every poor man's home,—a clean place, a capacious room, where conversation and excitement may be found, where everything is bright, alluring, and adorned with some kind of taste, where for a penny or two he may get something that looks better, and tastes pleasanter than the water in his butt. The surprise is, not so much that one man here and there reels home drunk, and a savage, as that for every such one there is not twenty. Our intrusive visits, as some would call them, into filthy and diseased houses, benevolent as they are, on behalf of those who cannot always help themselves, have example even in the most remote times and from the highest authority. The ancient authority was more imperative, and made it more a matter of conscience. In the ancient Jewish Law, it was ordained, that he that owneth the house shall himself come and tell the priest, saying, 'It seemeth to me there is, as it were, a plague in the house.' The priest was then to command the emptying it, so that 'all in the house be not made unclean.' He was then to cause it to be scraped within and without, and finally he was to pronounce when the house was clean and might be again inhabited. The priest was, you perceive, the medical officer of health under the Jewish Law, and this text of Leviticus is the thirteenth section of the Disease Prevention Act." The process of the physical deterioration of workmen and their families who are drawn into insanitary conditions about places of work, is illustrated by the Government works at Sheerness. Ten years ago, on investigation, we found the condition of the workmen employed there as reported:—

"Dr. Anderson, medical officer of Her Majesty's dockyard, in his evidence, states that ague and intermittent fever prevail more or less all the year round, that the inhabitants are subject to diarrhœa (a foul air disease) and that there is always a number of men from the

dockyard on the sick list; such as are convalescent have to get lighter work, while at the same time they perform a smaller amount. The public service suffers not only from this cause, but also from the fact of the men at Sheerness being allowed each 2*s.* extra, chiefly on account of the present unhealthy state of the district and place. Taking the number of men employed at one thousand, the loss under this head alone amounts to no less a sum than £5,200 per annum; but the whole of this sum might be saved."

It has not been saved. Ten years ago orders were issued for the application of the Public Health Act, but there being no power to enforce the execution of those orders, little or nothing was done upon them, and the following is an extract from a Report to the Privy Council, just published, on the present condition of the place:—"Apart from the general question of physical suffering unnecessarily caused throughout the whole Island of Sheppey by these entirely preventible malarious diseases, it seems a matter of some national moment that, of every one thousand men employed here in Her Majesty's dockyard, more than a third part (perhaps more than half) suffer during the year from disorders which, more or less decidedly, are referred to that cause, viz. that 148 of them suffer fever, and that each of the 148 is thus kept from his work for, on an average, 9¾ days; that 63 of them suffer neuralgia or other like pains, and that each of these 63 is thus kept from his work for, on an average, 10⅝ days; that 158 of them suffer from bowel influences, and that each of these 158 is thus kept from his work for, on an average, 5 days; besides that a very large amount of unrecorded illness and disqualification prevails among other members of the force; while, in the garrison of Artillery at the same important station, the prevalence of unnecessary illness is probably of equal amount; and while, even among the naval force which guards the entrance of the Medway, the same sort of suffering is so prevalent, that Sheerness is said to be spoken of at Chatham hospital, as 'the African station of our home service.'"

In other places as bad, there is no extra allowance to the workmen—if that were a cure; and what is the condition of the workmen's children whom he must have with him! The report says, "Of 121 boys, and 119 girls, who at the time of the inquiry were present in the National School, 108 boys and 79 girls (or more than three-fourths of the entire number of children) were stated to have had ague; ten other girls were stated to be absent with ague; the number of boys absent for this cause was not ascertained."

Papers read in this Department have been replete with illustrations of the physical deterioration, produced in this city itself, by insanitary conditions. Medical men witness and appreciate the physical evil, whilst ministers of religion and the police observe and can estimate the moral deterioration attendant upon these insanitary conditions. The minister of one of your crowded parishes, who is zealous and incessant in his labours to retrieve the fallen, describes to me the painful position in which he is placed—in this respect, that in

the cases in which he succeeds, instead of gaining them, as he might fairly hope, as permanent additions to his flock, he succeeds in sending them away as emigrants; for those who are raised above the surrounding conditions declare their inability to remain and contend against them. In the course of a former visit of my own to one of these wynds, I met with a very intelligent artisan, whom I questioned as to his budget, from which it appeared, that one-half of his wages, or nearly double what he would have earned in a rural district, was spent in whisky. In answer to my remonstrances that so sensible a man as he evidently was, should do this, he replied —" If you were to come and live and sleep here, you, sir, would drink whisky too." Impelled by the force of this answer, I investigated the habits of the same class of labourers, when living in overcrowded town residences, as compared with their habits when living in harvest time in the rural districts, and I found that there, with equal facilities, they really did drink much less, when relieved from the more depressing atmosphere.

It is a trite observation applicable to this subject, that whilst the advance in the physical sciences, from the careful examination of facts, is rapid; in social science, from an indifference to the facts, a commencement has yet to be made. As primary elements, the effect of physical conditions upon habits and morals has yet to be understood. Thus, a member of the House of Commons cited, without question from any one, the amount of illegitimacy as a test of the state of education, without knowing, or caring to learn, what proportion of our increasing numbers are crowded, both sexes together, in single rooms, and often in single beds, as displayed in respect to this city, in papers read before the present Meeting. If he had inquired, he might have learned that in some urban districts between sixty and seventy per cent. of the population have only one single living room for a whole family; in which one room young unmarried men and women lodgers are commonly taken; in which one room they live and sleep, and births, sickness, and deaths take place, and the dead are retained amidst the living until interment can be obtained. Without repeating the inquiry whether these are conditions in which well-educated artisans can be expected to marry and remain—and what must be the home education of the children reared in them!—I might ask your consideration of the effects on the morals of these adverse physical elements—1st, the depressing effect of the foul air, in provoking an appetite for alcoholic stimuli to withstand it; 2nd, the high wages in furnishing those means of relief, and of indulgence, which blind the judgment and excite passion; 3rd, the overcrowding, the massing both sexes together, under circumstances of powerful provocation, and of the entire abolition of moral restraints, to the destruction of moral as well as physical health. Such elements are as capable of analytical observation as those of inorganic substances by the chemist. When the social scientist—if he may be so designated—examines these elements of moral, as

well as of physical or bodily combustion, I apprehend that his difficulty will be, to satisfy himself how it is that the moral, as well as the physical combustion, is not greater and entirely destructive of the effects of all religious and moral education whatsoever. We may be sure that the highest education and training that many of the class to whom the objector in Parliament belongs, would fail to completely withstand such noxious adverse influences. After all, however, we have yet to excite a desire on the part of popular representatives to ascertain the very elementary facts, the clear perception of which is requisite for efficient preventive legislation, as well as for common civic administration, for the improvement of the population.

It rests with ministers of religion to excite a truly Christian feeling and sense of duty in earnestly applying the facts already ascertained for the prevention of suffering, and to remove that indifference which allows evil on the largest scale to continue, if it be in an accustomed routine, if there be no visibly violent destruction, no smashing of limbs, nothing to excite the imagination with spectacles of blood, with manifestations of passion to create an individual and dramatic interest. Thus, the whole community are excited by the dramatic interest connected with the murder of one child by violence, whilst the Registrar-General's returns of such annual numbers as eighteen hundred children burnt or scalded to death—included in upwards of thirteen thousand annual deaths from violence, amongst which are upwards of five thousand deaths from fractures and contusions, reported as "due to the absence of precaution which the new mechanical agency of steam has introduced;" being divested of manifest passion, or individual interest, are read and passed by with vacant apathy, or worse. The anti-social feelings to be met are those which disregarded the warnings, that whilst the chances of the soldier were as one that he would fall by the hands of the enemy, they were as three, and they proved to be as four, that he would, if neglected, fall by insanitary conditions;—those feelings in which, on the announcement of the impending visitation of the Asiatic cholera, by which 70,000 people were slain, the claim for efficient measures of prevention was received with scoffs and laughter; those feelings in which, on a late occasion, the representatives of the corporation of Manchester, in defence of a local Bill, supported by owners of inferior tenements, for preventing the removal of middensteads or cesspools, in answer to the allegation of an excessive death rate, as arising from them, were permitted to plead, unrebuked, that the excess of the death rate "was *only* in children," *i. e.* only a preventible slaughter of upwards of two thousand children annually —only two thousand mortal agonies, two thousand cruel bereavements, of as many mothers and heads of families! And yet, if only the mere economical considerations were regarded, it may be shown that the children who in a few years have been sacrificed from the neglect of proved preventible causes, would have supplied the labour of which the district is now in need.

Being impressed with the extent of evil affecting the labouring classes, developed in the course of their investigations, the common elements of which are unknown or unattended to, the foreign members of the International Statistical Congress which recently met in London, composed chiefly of men holding high permanent deliberative or executive offices under their respective governments, amongst whom were M. Quetelet and M. Visschers of Belgium, M. Legoyt of France—in all, fifty delegates—signed a declaration in the following terms, to which they requested the signature of Miss Florence Nightingale at their head :—"The Congress commends to the attention of statesmen, of economists, of philanthropists, and of administrators the study of the general condition of the labouring classes, of their wants, of their resources, and of the measures for the promotion of their welfare." I will not stay to comment on the fact of the elements affecting the condition of the great mass of the prominent labouring classes being declared by such high international authorities to be at this time really a new subject of study, as for practical purposes it will be found to be ; but I will refer to a recent speech of an eminent political leader, made on the occasion of the foundation of a ragged school in our chief manufacturing county, in which speech he congratulated the meeting on its vast progress in physical improvement of the people, of their comforts and their clothing, as a consequence of the increase of manufacturing and commercial prosperity. "Nor is there," he said, "any more certain test than the rapid increase of a population, of the physical well-being of a country." I should have been very glad if in official reports this proposition were not proved to be wholly erroneous in its unrestrained generality, and were it not proved to be so in respect to that particular county, Lancashire, where you may frequently see similar congratulatory expressions from persons of opposite political persuasions. But it should have presented itself for inquiry, why, with so much material progress, are masses of children there, ragged and in a state of destitution, claiming the aid of charity ? Mr. Edward Tufnell, who has the superintendence of the reformatories, reports that sixty-five per cent. of the children found there are orphans. And whence this mass of orphanage? and, in Liverpool and Manchester, an excessive mass of widowhood, as shown by the reports, corresponding with the excessive death rates there ? The answer given on investigation, is, that it arises mainly from the excess of preventible mortality from typhus, dysentery and other filth-diseases, which are banished from common lodging houses, but which are rife in the cesspool-tainted houses in which the operatives are crowded, to be near their work, and for which they pay enormously high rents, on account of the monopoly of the positions.

The members of the International Statistical Congress would recognise the fact, that a death rate represents the relative amount and sum of human suffering, and is one of the best tests of the physical progress of a country. In population as well as manufacturing prosperity, the progress of Lancashire has been the highest, and

yet the physical condition of its whole population, as determined by that test, and especially of the working population, is really the lowest. Recent statistics, showing the condition of the different classes of the population, have been applied for, and have not been obtained; but from the present state of the general death rate, it may be confidently averred that their relative position has little changed. The following statistical return, which I gave in my report on the sanitary condition of the labouring population of Great Britain, and which was confirmed by the subsequent investigations of Dr. Lyon Playfair in Lancashire, shows the relative sanitary condition of such rural districts as those from whence the strength of the country is drawn, as contrasted with the effects of the insanitary conditions of towns where it is absorbed:—

Average Age of Death.

	In Manchester. Years.	In Wiltshire. Years.
Professional persons and gentry, with their families	38	50
Tradesmen and their families (in Wiltshire, farmers and graziers are included with shopkeepers)	20	48
Mechanics, (agricultural) labourers and their families	17	33

Towns which were formerly in the relative sanitary condition probably that rural towns are now in, which have much open space, have, as Dr. Lyon Playfair shows, deteriorated in the physical condition of their population; and how should it be otherwise, for high wages will not ward off the effects of confinement in crowded and heated factories, which are ill ventilated; nor of sleeping at night in close, ill-ventilated rooms, in an atmosphere which is a compound of that of a chimney and a privy. Indeed, it is matter of experience, that when manufacturing prosperity has had a check, and the workmen are thrown out of employment in large numbers, the fever wards of the hospitals of the manufacturing towns are immediately thinned, and this for the simple reason, that the men are out of the crowded rooms, and, though living on less and simpler food, they are at large in the less impure air of the open streets.

Dr. Lyon Playfair reported that—"The great infantile mortality occurs, for the most part, among the poorer part of the population, as is seen from an examination of the return from Preston:—

Gentry	18	per cent. of deaths	under 5.
Tradesmen	36	ditto	ditto
Operatives	55	ditto	ditto

This may account, in a great measure, for the following very startling table, drawn up by Mr. Cartwright. It will be observed, that while in 1783 the average age of death was 31 years in Preston,

and the percentage of infantile mortality 29 per cent., the average age of the same town at the present time is reduced to 19½ years, in proportion to the increase of population.

"Similar results attend the examination of the parochial registers of other towns. Thus, I find, by an analysis of the registration books of St. Nicholas church in Liverpool, that a diminution of the average age of death has occurred: from 1784 to 1810 the mean age of death varies from 24 to 26 years, but during the last 7 years it varies from 17 to 20 years."

Table showing the Average Age of Death of all Classes in Liverpool from 1784 *to* 1810, *and in the years* 1841-42.

	1784-1810	1841-1842
Gentry	43 years	43 years
Tradesmen ...	23½ „	19 „
Operatives ...	18¼ „	16 „
All classes ...	25 „	20 „

The like proportions will be found to prevail in other manufacturing towns. The lives of the adult workmen there are also relatively shortened, and Dr. Lyon Playfair, after giving a table showing this, thus recapitulates some of the results in physical deterioration in Lancashire, such as now goes on in our manufacturing towns in general:—

"The table gives the general result, that there are every year in Lancashire 14,000 deaths and 398,000 cases of sickness, which might be prevented; and that 11,000 of the deaths consist of adults engaged in productive labour. It further shows that every individual in Lancashire loses nineteen years, or nearly one-half of the proper term of his life; and that every adult loses more than ten years of life, and from premature old age and sickness much more than that period of working ability. Without taking into consideration the diminution of the physical and mental energies of the survivors, from sickness and other depressing causes; without estimating the loss from the substitution of young and inexperienced labour for that which is skilful and productive; without including the heavy burdens incident to the large amount of preventible widowhood and orphanage; without calculating the loss, from the excess of births, resulting from the excess of deaths, or the cost of maintenance of an infantile population, nearly one-half of which is swept off before it attains two years of age, and about 59 per cent. of which never become adult productive labourers; and with data, in every case, much below the truth,—I estimate the actual pecuniary burdens borne by the community, in the support of removable disease and death, in Lancashire alone, at the annual sum of five million of pounds sterling. I would draw attention to the columns representing the numbers of preventible cases of death and sickness in Liverpool and Manchester, or in any other of the large towns, to show the immense amount of misery which might be saved by proper sanitary arrangements.

"It has been stated," Dr. Playfair continues, "by Mr. Chadwick, that the annual slaughter, from one disease alone—typhus—a disease which formerly raged in, but is now banished, as an epidemic, from, our prisons and our navies, is greater in England and Wales than the loss sustained by the allied armies at the battle of Waterloo. Yet what sort of battle do we here find fought and won by preventible disease against the population of the county of Lancaster? The labouring population of this county have always supplied a large contingent to the armies of the country. It furnished the strength of the army which fought at Flodden; and Cromwell, speaking of his Lancaster regiment, said, finer soldiers were never seen on a battle-field. The Guards, until recently, were largely recruited from Lancashire. What would be thought of a war in which 5000 of the able-bodied men of one county fell every year in battle?—and yet this is only one-half the number annually slaughtered in that county by removable epidemics! Yet this annual loss of able-bodied men, so much greater than the most cruel of known wars in modern times, is scarcely more severe than the loss sustained by the continued physical deterioration of the survivors. It was a matter of constant complaint to me, by the recruiting officers in the various districts of the county, that the sons are less tall than their fathers; and that the difficulty is constantly increasing of obtaining tall and able-bodied men.

"I found the indications of recruiting officers often shrewd and useful; but, without one exception, they complained of the difficulty of getting men 'to pass the surgeon' in this county. As an example, I may adduce the evidence of Sergeant Farrell, of the 47th Regiment:—

"'Have you long been engaged in the recruiting service?'

"'For nearly ten years.'

"'Do you find it equally easy to recruit in Lancashire now as formerly?'

"'Where I could get ten recruits formerly, that I could venture to send up, I can now only one, and that one is often rejected. Out of seven I got lately, only one passed.'

"'Do you think that this difficulty arises from people getting better wages at factories than in the army?'

"'No, not at all. When persons go to work so soon, they do not grow up to be the proper size, they have always some deformity, and in the towns, somehow or other, they are pale, sickly and thin in flesh. The only place where I can get good men is from the country districts.'

"'What reason does the surgeon assign for refusing the men you send from the towns?'

"'For being too thin, not being round-chested, and not standing straight.'

"'From what towns do you find it most easy to procure good men?'

"'I have been only in Yorkshire, Somersetshire and Bristol. In Yorkshire there are some good men, better than I have found in Lancashire, but they are by far the best in Somerset. In that and

other country districts I could easily get good men; but here, in Rochdale, there is almost no use in staying. I have only been able to pick out thirty good-looking men for the last eighteen months, and out of these only one was passed by the surgeon for every four rejected.'"

Dr. Lyon Playfair continues—"Through the politeness of the head recruiting officer of the Liverpool district, which includes Lancashire, Cheshire, and parts of Shropshire, Derby, North Wales, and Staffordshire, I have obtained returns of the number of persons sent up from various districts, and rejected as unfit for service. The total number sent for inspection from all the districts to the staff surgeon in Liverpool, between the 1st of January, 1843, to 31st October, 1843, was 1,560, of which 876 were approved, 684 being rejected. In Liverpool, during the same time, 930 were presented for examination, 439, or 47 per cent. being rejected."

There has been one check to the rapid physical deterioration in the manufacturing districts, in respect to the overworking of children, which I shall subsequently notice. But it is right to state that the insanitary conditions are attended with moral as well as physical deterioration; crime following most closely those conditions, where there is a perception of the short duration of life, and where the appetites for immediate enjoyment amongst the ill-educated and ill-trained are strong and reckless. Thus, taking the counties in the order of their sanitary condition—those first where the death rates are the lowest—and dividing them into groups, the relative proportions of crime to each ten thousand of the population are as follow :—

	Proportion of crimes of violence and passion.	Proportion of crimes against property with violence and malice.	Proportion of crimes against the public peace.	All other crimes.
The fourteen least unhealthy counties ...	40	1·00	·90	13·69
The fourteen intermediate counties ...	60	1·73	1·60	15·51
The fourteen least healthy counties ...	66	1·69	2·50	17·75

Let us take the two extreme single counties :—

The most healthy county (Westmoreland)..	17	1·71	2·47	2·48
The most unhealthy county with the highest manufacturing prosperity and wages (Lancashire)... ...	61	1·91	4·17	20·27

The average age of death of all who arrived at the adult stage was in Westmoreland, 58 years and 10 months; whilst in all Lancashire,

that is to say, including also all the agricultural population of the county, it was 50 years and 2 months.

The identity of the seats of disease and physical deterioration with the seats of moral deterioration and of crime, in the midst of manufacturing prosperity, was displayed in the Report on Preston to the Health of Towns Commissioners by the late Rev. Mr. Clay, the chaplain of the County Gaol at Preston; and the effect of sanitary measures in the reduction of crime is shown by Mr. May, of the Town Clerk's Office, Macclesfield, in the paper printed in the Transactions of the Association,* giving an account of the first effects of sanitary measures in that town. Worthy persons in Lancashire, who have done much for the improvement of the working classes themselves, but generalising hastily from particular instances, have, in political speeches and papers, boasted of the progress of the population, and a relative superiority in intelligence: the answer to which is, the fact of their low physical condition, and the continued disregard of the expositions for the removal of the causes. But what do we find the actual general intellectual position of the county to be in reality? According to the last of the returns of the Registrar-General, whilst the proportions of persons signing the marriage registers with marks only, were, in all England—males, 27·7 per cent.; females, 38·8 per cent.;—in Lancashire it was—males, 30 per cent.; females, 56 per cent. The progress of education, in the reduction of the number of marksmen to these yet high proportions, has been less than one per cent. per annum, so that at the present rate it will take more than half a century to fit the female population to impart to their children the lowest elements of education. In the adjacent district of the West Riding, which follows in manufacturing prosperity, Leeds has a death rate of 30 in a thousand, with an infantile slaughter before the attainment of their fifth year of half of all born; and what is its real educational position and progress? In 1839, the proportion of females married, who could not write their own names, was 52 per cent.; in 1857, it was still 50 per cent.

Whilst, then, in the county most referred to for physical progression, we find the proof, when examined, of a vastly increased population, and high prosperity and high wages, is attended with excessive physical and moral deteriorations ;— in Ireland there was the example of an increase of population attended with—poverty,—and under insanitary conditions, physical deteriorations. Thus, in four counties of Ireland where the increase of the population was the greatest —there, where 61 per cent. of the habitations were mud hovels, having only one room—there the annual proportion of deaths from epidemic diseases was 47·8 per cent., and the average age of death was only 26 years and 8 months; whilst in the four counties where the rate of increase of population was only one half, where there were only 29 per cent. of single roomed mud hovel habitations ; there the deaths

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* Vol. 1857, page 403.

from epidemic disease were 35·5 per cent., and the average age of death 33 years and 4 months. As amidst our English town populations, heaped together in single rooms, so in the four counties where the labouring classes are living in the greatest proportion in single-roomed mud hovels, and where there is the largest increase of population, there also there is corresponding moral deterioration, and just double the average of crimes of violence and of passion.

It is right to state, in relation to these instances, to guard against erroneous political speculation, that in New York and other American cities, the insanitary conditions and overcrowding is often as great; as also, according to the information I have received, the death rates and the physical deterioration, although population and wages increase even more rapidly than in our manufacturing districts. Thus, Mr. William Chambers states:—"In New York there is a place called the Five Points, a kind of St. Giles's; and here, and in some other quarters of this great city, you see and hear of a sink of vice and misery resembling the more squalid and dissolute parts of Liverpool or Glasgow. For this the stranger is not prepared by the accounts he has received of the condition of affairs in America. Wages of manual labour, a dollar to two dollars a day. Servants, labourers, mechanics, wanted. The rural districts crying for hands to assist in clearing and cultivating the ground. Land to be had for the merest trifle. The franchise, too, that much coveted boon, offered to all. From whatever cause it may originate, New York is beginning to experience the serious pressure of a vicious and impoverished class. Prisons, hospitals, asylums, juvenile reformatories, almshouses, houses of refuge, and an expensive, though strangely ineffective police, are the apparatus employed to keep matters within bounds. The governors of a cluster of penal and beneficial institutions report that in 1852 they expended 465,109 dollars in administering relief to 80,357 persons. Passing over any notice of the many thousands, including crowds of recently arrived immigrants, assisted by other associations, we have here a number equal to one in seven of the population coming under review as criminals or paupers in the course of a year—a most extraordinary thing to be said of any place in a country which offers such boundless opportunities for gaining a respectable subsistence."

In this, and in other American cities, the conditions of such districts are as little known as our own to the more respectable classes of inhabitants, and the terms of the resolution of the International Statistical Congress would be applicable to a greater extent than might be conceived. When we sent inspectors from the General Board of Health, upon petitions, to examine the sanitary conditions of towns, one of the instructions we gave them was, that they should endeavour to get mayors, town councillors, and particularly those who were opposed to the introduction of the law, to accompany them in their inspections. In our report laid before Parliament, we thus referred to these inspections:—"A further common and important feature observed in the local inspections has been the discovery, by the chief inhabitants, or those holding leading local position

and office, who accompanied the inspector in his perambulation, how little they themselves knew of the real condition of their own town, or of those portions of it which are occupied by the majority of the inhabitants. The places properly designated as 'fever nests' the seats of epidemics, it appeared had never been visited by them, and were almost as much unknown to them as any foreign territory which they had never seen. On these occasions they frequently acknowledged frankly, that they had been, until then, entirely unaware of the condition of the places visited. The town clerk of one town, writing to the inspector, states, that they were unaware, until his visit and report, what the condition of their town really was."

The chief means for the removal of the insanitary conditions of town populations, and the evils arising from them, have been tried, and will, when examined, be found to be effectual, and in their results economical. They are set forth in sanitary reports and instructions, from which it will be found, on competent and impartial inquiry, there has been no deviation or substitution unattended with waste and expensive failure, even in the application of the refuse of towns and the avoidance of the pollution of rivers. But these means pass unheeded, by that simple ignorance of the evils requiring attention, which, I must repeat, is the first condition of mind calling for removal by the diffusion of sound sanitary knowledge. Another condition of mind to be dealt with, is that superficial knowledge which cursorily recognises the existence of the physical evils—but treats them as inevitable, and extends to them such charity for their mitigation as that which contributes to the maintenance of hospitals for the treatment of marsh or foul air diseases, in utter disregard or ignorance of the fact, that the marshes may be drained, or that the filth may be cleansed. The worst condition of mind which social science has to encounter, is the interest-begotten prejudice and obstinate pessimism, which utterly disregards the proved means of prevention, and alleges that the "poor must be poor," as if to be poor it was necessary to be miserable;—which adopts as a maxim of ineffable official wisdom, "never to act until it is obliged, and then to do as little as it can," for the relief of human misery, and recklessly frustrates any attempts to that end.

Let us hope that the progress of social science may meet with fewer obstacles in the promotion of the application of science to the relief of children, to whose erroneous physical training and insanitary treatment in the school stages after they have escaped from the perils which so early sweep away half of all born,—I now beg leave to direct special attention, as a topic of pressing importance at this time, when the subject of these defects of our national education is under consideration.

So much irreparable mischief has been done in consequence of the surrender heretofore, in mediæval times, of the education of youth to people of the cloisters, who trained them up after their own recluse and slothful habits;—so much evil is still doing by a blind routine in

a course which ignores the requirements of special training for the body, as well as the mind, that it is requisite to assert the claims of physiology and sanitary science to consideration, in any general system of education.

Of our crowded town children who escape the grave by their fifth year, medical officers have assured me, that, as a general rule, on a proper examination, not above one-third could properly be passed as free from serious congenital or other bodily defect. Of the classes drawn from neighbourhoods in the worst conditions, a medical officer assured me, that of between four and five hundred boys, he had great difficulty in mustering thirty to pass any surgeon's examination.

Such being the common physical condition of labouring men's children, and indeed, of the children of the lower middle classes, reared in towns, what, but a skilful course of physical training, should be taken to retrieve it? They are, however, subject to a course exclusively mental and sedentary, and that mental course an injurious one, in disregard of the laws of physiology. Let us consider what those laws require for the bodily development of children.

If we observe young children in a state of nature, their peculiar mobility during periods of growth, their incessant changes and activity for muscular exertion—changes short at first, and longer as growth advances, excited by quickly varying objects of mental attention, with manifestations of pleasure when allowed free scope, of pain when long restrained;—if we ask to what these changes subserve, we receive for answer from the physiologist, that they serve to stimulate the whole nervous and muscular system, and to promote healthy bodily assimilation and development. The theory and the common practice of school instruction, is of five, at the least, or six hours and more of quietude and muscular inactivity, with intervals of three hours each with only occasional variations of position, and during this bodily inactivity, continued attention and mental labour by very young children, say from six or seven to ten years old and upwards. To ensure this bodily inactivity, and enforce continued mental attention and labour (during periods in which it is difficult to sustain it, and injurious to exceed it, even for adults), the service of the school teacher is made to be one of severe repression, to keep little children still, whilst every muscle is often aching from suppressed activity. I have the warranty of Professor Owen and other physiologists for saying, that the resistances of children are for the most part natural vindications of the laws of physiology, and I am prepared to show elsewhere, on the evidence of some of the most experienced and successful school teachers in the kingdom, that they are violations of the laws of psychology and injurious mentally. The evil effects of the common bodily constraints during long hours in school are seriously manifested on girls, and especially on girls of the middle classes. In Manchester and some of our manufacturing towns, with increasing prosperity, an increasing proportion of the female children of parents originally from the rural districts are sent to boarding schools as well as

day-schools using long hours of sedentary occupation. Mr. Roberton, the surgeon, who has had special practice in cases of disease affecting females, shows that the proportion of mothers of that class who have been so trained and educated, who can suckle their own children, is decreasing,—which in itself is a source of much social evil, and an injury to the wet nurse's own child, who is displaced for the offspring of the incapable mother. He proves statistically, that the deaths from childbirth are above eight times more numerous amongst females so brought up than amongst females of a lower condition who have had less school restraint and more freedom. Dr. Drummond, a physician of Glasgow, specially conversant with the diseases of females, declares to me that all the evils observed by Mr. Roberton in Manchester, as arising from "the neglect of bodily training," are still more grievously prevalent amongst the females of this city.

Females subjected to the long hours of sedentary application, either at home or at boarding school, are peculiarly liable to spinal distortion, to hysteria, and to painful disorders, which prevail to an extent known only to physicians—making life burdensome to themselves and wretched to their unhappy offspring, for it is proverbial that "Ailing mothers make moaning children." These bodily weaknesses in the heads of families have a widely depressing influence. Insanitary conditions which enfeeble the body, and predispose it to disease, make the mind the body's slave: sound sanitary measures tend to enfranchise the mind and make it the body's master. Parallel with this evidence as to the evil effects produced by the violation of the laws of physiology by the prolonged restraint in school of young and growing children, I have the evidence of trained school teachers of wide experience under the best system, that children between seven and ten years of age do not and cannot retain a bright voluntary attention—the only profitable quality of attention —on the average longer than two hours in the morning and one hour after dinner. Further, I have extensive and, as I conceive, complete evidence, that under conditions where suitable bodily exercise is provided, where there is a better compliance with the physiological law of development, better mental accomplishment is communicated in half the common school hours. Thus the old Greek paradox is realized, that the half is better than the whole.

To some extent the aggravation of children's ailments, by the forced inactivity of ordinary school, is mitigated as respects boys by their greater freedom and opportunities of exercise at play; and it is girls, on whom the most grievous suffering is entailed by the present course of school and other bodily restraints. So great had the evils entailed by the cloister system of early training become for middle-class females, that for their protection in Sweden a special system of school gymnastics for females, formed by a celebrated medical professor of the name of Ling, has been long introduced into practice, and is spreading in Prussia, and in other parts of Europe. In England, mothers of the middle and higher classes take

their daughters into the towns to receive dancing lessons. In Sweden, mothers of the same class take their daughters into Stockholm to receive gymnastic training. So important are the effects produced, as I learn from Sweden, that they are now adding, as means of bodily, which really includes mental training, swimming schools for girls as well as for boys. The gymnastics are systematised into two divisions—Sickness gymnastics, for retrieving bodily defects and ailments; and health gymnastics for simple bodily development. I am informed by Mr. Rahusen, a delegate to a section of the Association, and a member of the School Commission of Amsterdam, that the evils attendant upon the present amount of sedentary confinement in schools are beginning to attract attention in Holland, where they have under trial a system of exercises for schools, advocated, with short-time teaching, on physiological grounds by Dr. Schrieber of Leipsic. Now I find the views expounded by Dr. Schrieber entirely in accordance with the sanitary principles which I submit as applicable to the treatment of children in the school-stage. "The chief question," he says, is, "How are our children brought up? Is it according to the laws of nature? The answer is No, or we should not see so many children who were rosy or healthy before going to school become pale and bloodless after school has begun." Or,—I may add—who, becoming ill at school, are prescribed absence from it, and more natural treatment, as a means of cure. From Dr. Engel, the delegate to the International Statistical Congress from Prussia, I learned that the evils arising from excessive school confinement were beginning to attract attention, and that some trials of short-time school tuition, with more of bodily exercise, had been attended with intellectual success. I anticipate that those who have preceded us in educational progress will find it necessary, with us, to retrace some of their steps. In some of our best managed district pauper schools in England, and also in the Royal Military Asylum at Chelsea for the training of the children of soldiers, we have proximate experience of the working of less systematised sanitary exercises, combining the military, and in some cases most advantageously a naval, drill with swimming, and other bodily exercises, together with a reduced amount of sedentary application in school—generally half school-time—with very high success both in the correction of the bodily defects abounding in that class, and in strengthening them physically for the future service of the world, as also in strengthening them morally by discipline, and mentally by a brighter voluntary attention during reduced, as well as less wearisome, hours of school instruction. The half school-time children of this class, having eighteen hours of book instruction weekly, proved upon examination to be even superior in book attainments to those of the same classes, under the same system of school instruction and under the same teachers, who are kept together in school thirty-six hours weekly. I also find it a fact generally acknowledged by school teachers, that in the mixed schools of the lower classes the book attainments of the girls who are employed one-half of the school-time

in sewing and in other industrial occupations, are fully equal to those of the boys in the same schools, who are exclusively occupied in book learning. It is common to hear the manly education of English youth, and of the healthy exercise they have received in boat-racing and cricket, made matter of boast; but of what class of youth, and what proportion of the population, do they form who receive these advantages? In the densely covered town districts what space is there for artisans' children to partake of any such exercises? or what time is there after the present school hours to get to any space out of the town to engage in them? These or other games ought to be maintained and provided for, but they do not, however, dispense with systematised bodily training. Cricket often leaves contracted chests, which a well-applied drill or systematised gymnastics expand; round shoulders, which the drill makes straight; shambling gait, which the drill makes regular and firm and quick. The youth of Eton and Oxford, I have been assured by the collegiate authorities, are greatly improved in health and strength and in every way, by the military drill in addition to their common exercises. For the middle and higher classes who could afford it, the cavalry drill, or horse exercise, would be a valuable sanitary as well as a civil and military improvement. As denoting the connexion between body and mind, it may be mentioned, that as a general rule, to which there are fewer exceptions than might be supposed, those who are foremost in the drill and in bodily exercises are found, in low schools as well as high, to be the foremost in mental exercises. Our higher education, which governs the education of the middle and the lower class, is assumed to be classical, but in the hands of the ecclesiastics of the middle ages from whom it is derived it ceased to be so; it is not now so, and our movement ought to be to make it strictly so; for the really classical education, advocated by Plato, Aristotle, and Galen, and maintained by the Romans during their greatest strength, was divided into three parts, of which one was mental training, that of the school teacher; another bodily, of the gymnasiarch; and a third, accomplishment, such as music. But care and exertion will be required that suitable provision is made for the bodily as well as mental training of females.

The evils I have described as arising from an excess of bodily constraint, and the neglect of physical training, would, to a greater or less extent, prevail in schools in the best sanitary conditions in respect to ventilation, warmth, and light; but what are the common insanitary conditions of schools?—often of the middle and higher, as well as of the lower class. What is their frequent sanitary aspect?

The first introduction of the labouring man's child to school in towns is thus described in the report of the Rev. J. P. Norris, one of Her Majesty's school inspectors: "At eighteen months or two years old he is sent to one of the dames who gain a livelihood by taking care of young children whose mothers are at the factory. Here, from seven in the morning to eight or nine at night, he is stowed away in a small close room, without exercise or change of air,

predisposing the constitution to consumption, which is a common malady in the Pottery towns."

The Rev. M. Mitchell, another of Her Majesty's school inspectors, states, "There is no calculating the permanent injury that must arise to the health and constitution of children, immured for hours in rooms whose air is poison. The ultimate results must remain unknown. Those which we do perceive are constant restlessness and an impossibility of commanding the attention, a sickliness of look in the instructor, and great exhaustion with weariness. The work of teaching becomes a labour and drudgery; energy and life cease, especially in the latter part of the day, and the instruction becomes a nullity. As year after year passes away, the derangement becomes more confirmed, and the result is, that the master loses his activity, his school lacks its success, and too often he retires, with spirit broken and health infirm, to seek some other field of labour, and complains of the unhealthiness of school-keeping, when, in fact, he should only regret the uncared-for insalubrity of his ill-ventilated and imperfectly lighted room. I know this to be the case from the sensations constantly experienced after inspecting schools so circumstanced; the fatigue and weariness consequent on a day spent in some rooms are intense, from no other cause but this; and medical men, and those who have studied the subject, are well aware of the fact."

Again, he says, in another report, describing the insanitary construction of common schools :—"It is a curious fact that, of the pupil-teachers and mistresses who have failed in health, all, with but one exception, have taught in schools thus constructed. It would be hardly possible to produce a more conclusive proof of the baneful effects of this sort of ill-ventilated and unlighted room. Strangers visiting the school only for half-hours do not feel it, but there is, doubtless, a silent, constant wearing effect, which in time does its work upon the bodily and mental health, and gradually undermines the constitution and the brain. . . . There is a peculiar wild look about the eyes of most teachers in such rooms as I have described; and there is a heaviness and want of energy in the conduct of the school which no physical ability seems able to conquer."

But these evils are not confined to the town schools. Mr. Watkins, the school inspector for the Northern districts, states that "doors and windows remain closed in winter, there being no other means of ventilation, and the air which the children breathe is in a state of great impurity. I have found it difficult to stay in schools in which the children have been for some little time previous to my arrival. And, to say the truth, the remedy in such cases is almost as bad as the evil. The windows are opened, a 'thorough draught' is obtained, the boys' bare heads and the girls' uncovered necks are exposed to it, in all its freshness. Thence ensue colds, catarrhs, and, it may be, the first seeds of consumption. But in such schools this is an event which rarely occurs ; the teachers, accustomed to the close, heated atmosphere, are chilly and unable to bear the fresh air of heaven. It is curious as it is painful to see to what an extent

those unhealthy feelings will sometimes carry them. At a school in Cumberland, on a bright, warm day in September, I found the doors and windows closed, a large red fire in the grate, the children—eighteen heavy boys and two girls—almost melting under the combined influence of fire and sun, whilst the master seemed perfectly unconscious of the temperature in which he lived, with his coat buttoned up, a shawl round his neck, a thick cloth cap on his head, and clogs over his shoes. In answer to my question whether he did not feel the room very warm, he said 'No,' that he was not very well. I have sometimes seen the steam covering the windows, and perspiration streaming down the children's faces, without, apparently, a suspicion on the part of the teacher that the room was insufferably and unhealthily hot and close. In several cases I have observed the air grates, recommended in your Lordships' minutes, stopped up, 'because they let in too much air.' It is mischievously true that fresh air is often an unwelcome visitant to the sedentary man, and that the schoolmaster, and, still more frequently, the schoolmistress, exercise their authority to exclude it from the school."

The Rev. Mr. Brookfield, another of Her Majesty's inspectors, states, "I cannot refrain from mentioning, as one effectual hindrance to more satisfactory progress, the uncomfortableness of schools; I mean as respects warmth, dryness, elbow room, and sightliness, for even the last mentioned particular has its influence. Disguise it as we will (excepting the case of model children, such as I have never found, and presume to be extinct in the South-Eastern counties), school-time is irksome, and if it is desirable to mitigate this irksomeness by every reasonable contrivance, how much more to remove every aggravation of bodily discomfort. To have to learn the mysteries of notation or orthography while sitting on a high bench, with frozen feet dangling above the floor, slate pencil dropping from the benumbed fingers, jacket reeking with the March rain, and not a pennyworth of cinder in the cheerless stove, is a predicament not unfrequently experienced, and illustrates a kind of difficulty with which children of an age not yet fortified against adverse circumstances have very extensively to struggle. . . . Bodily comfort, so far as is consistent with liveliness and discipline, is not a secondary, but a primary requisite in an edifice in which children of years too tender to battle with discomfort are to be assembled more frequently, for a longer time, and in greater numbers than in any other of the parish."

Now, as to the consequences of all this in the production of disease, Miss Nightingale, who began her career of devotion as a missionary in the schools of the poor, states in a letter to me on the subject—"I have unquestionably seen (in my schoolmistress days) bred, under my eyes and nose, scarlet fever in the higher class (even) of boys' schools. Every one has seen the same process as to measles in all rich and poor schools (National, Union, &c.). But parents, rich and poor, are so blinded by the idea that every body must have measles once in their life, and 'you had better have it young,' that they do not understand what they see."

It is no mitigation of the evils inflicted in the large proportion of schools, to which the descriptions cited to a greater or less extent attach, that there are others to which they do not attach. Under the half or short school-time system, half the evils attendant upon the insanitary conditions of common schools are prevented or mitigated; and where the hours saved from excessive sedentary application to book instruction are applied, as I many years ago contended they should be, to physical training, congenital defects are to a greater or less extent corrected. Their correction is a source of much public gain. I have collected the evidence of the employers of labour, who establish the fact, that the drill adds at the least one-fifth to the efficiency and value of youths and men as labourers in after life, four drilled men doing at least as much work as five undrilled lads or labourers. The drill teaches them quick attention, obedience, with the prompt execution of commands. Drilled labourers move together, lift together, pull together, and do their work smartly. They are less clumsy, and avoid the frequent accidents by which some five thousand lives are lost every year, the greater number of which are declared to arise from clumsiness and inaptitude. The superior aptitude communicated by the naval drill to boys at school has occasioned undersized and puny town-born lads to be preferred in the mercantile marine to the robust and strong but undrilled lads from the open cottages on the sea-coast, and preferred at lower premiums as apprentices. This bodily training which, to some extent, is begun in the infant school, but may be begun, and ought to be carried on, with the military drill, at the fifth year, may be completed by the tenth or eleventh year. By that time the weaker child will have been strengthened by bodily exercise, the moderately healthy child of the town artisan will be made comparatively robust, more apt for all industrial employment, more attentive and orderly, more prompt, and worth more wages; in his adult stage he will earn more by as many additional shillings per week, as the additional expense of his whole bodily training in childhood. An extra penny a week will have sufficed in childhood to defray the expense of his bodily cultivation. For civil purposes alone, and simply in the interest of the individual pupil, the improved bodily training, and the drill, is a profitable investment, totally irrespective of any national military objects.

I have, however, the professional warranty of Sir John Burgoyne, Lieut.-General Shaw Kennedy, and others of our generals, for stating the large military efficiency and economy derivable from an improved sanitary and educational treatment of the younger portion of the population. It is found that boys so trained are ready at once for the navy or for the army. They are trained more completely in the infantile or juvenile stage than they can be in the adult stage. Drillmasters declare that they can do more with children than with boys, and with both what they cannot do at all with men when the growth has ceased, and the frame is set. With the child they have to bend the tender twig, with the grown youth they have to set straight the

strong bent stick, with the young man their task is to bend the gnarled oak. At no greater expense than that of drilling recruits comparatively in the adult stage, I believe that the whole population might be drilled during their school-time without any interference with productive labour.

It is declared by impartial continental military authorities, that Britain has in her population the best military material of Europe, which is at present the worst treated. The first step in the amendment of that treatment is to fashion the material earlier. If we are to maintain our position, as of old, with lower numbers than others, we must revert to the treatment of our population, as of old, by beginning in the very infantile stage, as expressed by the good old Bishop Latimer, who, in his Sixth Sermon, preached before Edward VI., says, "The art of shooting hath been in time past much esteemed in this realm; it is a gift of God, that He hath given us to excel all other nations withal; it hath been God's instrument whereby He hath given us many victories against our enemies.... In my time, my poor father, a yeoman, who had no lands of his own, only he had a farm of three or four pounds by the year at the uttermost, was as diligent to teach me to shoot as to learn me any other thing, and so I think other men did their children; he taught me how to draw, how to lay my body to the bow, and not to draw with strength of arms as other nations do, but with strength of body. I had my bows bought according to my age and strength; as I increased in them, so my bows were made bigger and bigger; for men shall never shoot well unless they be brought up in it. It is a goodly act, a wholesome exercise, and much esteemed in physic. In the reverence of God let it be continued."

In our own time few Anglo-Saxon fathers can tell in what foreign climes his son may be, and what may befal him, to require the exercise of bodily prowess, for his course may, even if he be in civil life, as late events in our dependencies show, be, like that of the Apostle, "in journeyings often, in perils of waters, in perils of robbers, in perils by the heathen, in perils in the city, in perils in the sea, in perils amongst false brethren," against which it is needful that he should be bodily self-contained, capable of swimming, and ready to fall in with others for self-defence.

In proposing an extended military drill for the young, we only revert to old constitutional law and practice; for it is the old law of this country that the whole of the able-bodied population shall be trained to arms. There is, indeed, an unrepealed statute, that parishes shall provide butts, for such training in the use of the chief implement then known—the bow; and it is only requisite to substitute the modern implement, for which our people have the like qualification, to obtain pre-eminence,—the rifle.

It is proper to observe of the volunteer movement, that besides the other important public results, it will, if properly directed, be attended with some of the advantages of a sanitary movement, for an improved bodily training. Sanitary advice might have a place in the

guidance of the volunteer movement, as it has proved to be woefully needed in the regular army. On inspections, the sanitary officer would often see, in the pale and bloodless faces in the ranks, indications of the impending failures of strength and nerve to use their rifle steadily and effectively, and the need of special drill and treatment, to restore and augment that strength. As it is, however, the exercise in the open field cannot fail to be of sanitary advantage to our young citizens and men of sedentary pursuits, in improving their appetites and digestion, in increasing their strength, in giving them rest at night, in warding off disease, and making them work better, and last longer, as men of business. In one of the metropolitan district schools, the masters, from a false economy, dismissed the drill-master, and discontinued the drill. The pent-up muscular irritability broke out in irrepressible mischief and disorder, great damage of the premises, and riots in the dormitories and tearing of the linen at night. Flogging did not abate the disturbances. The drill was restored, on the prayer of masters and of the chaplain, the muscular irritability was appeased, and at night there was again sound repose and peace.

The volunteer movement, and the drill, properly directed, will also be an early-closing movement to the wine-houses at night, and a salutary police movement. For sanitary purposes, the exercises should be more systematised and varied, and the variations may be made to contribute to sustain the interest in it, which, without the stimulus of variety, will, it is apprehended, too soon flag.

With the body as well as mind comparatively enervated by injurious constraint in insanitary conditions and by under bodily and over mental work in the school stage, the children of the town labourer or the town artisan are then taken to a new stage, in which, however good the previous physical training might have been, a large proportion are permanently injured by overwork, that is to say, by work during the same daily hours as full-grown men, whatsoever those hours may be. As one of the Commissioners of Inquiry into the labour of young persons in factories, to whom was referred the Ten Hours Bill, agitated mainly for the protection of young children, with my colleagues, I adopted the principle that it was contrary to the laws of physiology to work the young child for the same length of time as the adult. If ten hours' labour was enough for the grown adult, it was too much for a young growing child. We found it proved that, by working children at the same pace as adults, a large proportion of the future labourers were crippled or weakened for life, and we concluded judicially that the Government was bound to interpose for protection of their bodily and mental powers. My colleagues agreed to recommend a limitation of juvenile labour to eight hours daily, as a compromise. I was charged by the Government with the preparation of the first Bill, and contended for a limitation of the labour of children to six hours, and for a compulsory provision for three hours' attendance at school, for powers to ensure the competency of teachers, with rating clauses to provide for good

schools where there were none—all of which provisions were carried through the House of Commons; but the rating clauses, and the powers as to the quality of the education required, were rejected in a committee of the House of Lords, at the instance of the Marquis of Salisbury, on the ground that, if carried, they would lead to a national education. The result of the bodily protection of the children is the almost entire disappearance from amongst the grown-up factory population, female as well as male, of the former frequent bodily deformities, and their vastly improved physical condition. Extreme long hours of labour, for adult as well as child, belong to a comparatively low state of manufacturing organization or administration, and of rude and comparatively inferior production. Extremely long hours prevail in manufacturing districts on the Continent, and I have received statistical evidence which shows that in those places where the hours of infantile labour are the longest, there the proportion of full-grown males who are unfit for military service is the largest. The principle of the duty of intervention by the State for the protection of the young, the future working stock of the country, was, however, carried, in respect to those engaged in certain textile manufactories, and its success is placed beyond doubt;—then why is it not extended to all ?

The educational clauses of the Factory Bill were crippled, as stated, and in a great majority of instances the education provided for the factory children was merely nominal, and hence the cry has been raised that the half school-time system is a failure, and doubtless it is a failure as it now stands in the majority of instances;—but where, from voluntary and accidental causes, good half-time schooling has been given, the success has been such as to establish important principles for the bodily as well as mental training of the young. The three hours' schooling clause is, however, efficient for one purpose for which it was intended, namely, as a security against bodily overwork. By ensuring that the child is for three hours daily in a school, we ensure that for that time he is not in the workshop or elsewhere at work. A general provision for compulsory attendance at school during a part of the day, would be a general provision for the protection of the young of the country, that they shall not be injured by being overworked—that is to say, by being worked for the same length of time as adults, which is always and everywhere, for the child, injurious overwork.

This principle it is extremely important to have understood, for proposals are constantly being made for admitting children to unrestricted duration of daily labour on the condition of presenting as qualifications certificates of the possession of an elementary education, *i.e.* competency to read and write—a provision which, where voluntarily adopted, as in some branches of unregulated trades, has proved illusory, and which totally ignores, as it is the common practice even of educationists to do, the existence of the principles of physiology. But, besides the protection against overwork gained by the half-school-time provisions, we find that where, as is frequent from the

liberality of enlightened manufacturers, good schools have been established in connexion with their works, or where the half school-time system has been established in district schools, apart from the adult paupers, as we originally recommended under Poor-law administration, important results have been obtained: first, the advantage for bodily growth of reducing the present common duration of constrained inactivity; next, the advantage for mental growth of reducing the common demands on the mental labour of infants and young children, by adapting them to their weaker and growing mental powers; and, generally, the advantages of combining physical with mental training. All the school teachers of acknowledged competency in the more systematised half-time schools, declare that the half-time scholars came from bodily labour to mental exercise with a brighter attention than the long-time scholars; and when these masters are asked whether they would, if they might, add to the daily time of tuition of the half-time scholars, they reply, they would not. It is also declared by them almost unanimously, that the book attainments of the half-time scholars during the same years are equal to those of the full-time scholars; but where direct examinations have been made for comparison, the half-time scholars prove to be superior. But, above all, the employers prefer them for superior aptitudes to the long school-time pupils. The full intellectual or educational bearing of the subject belongs, of course, to the Education Section. It was necessary here to show the fact, that sanitary treatment, requisite for the protection of the health and strength of children during the school period, not only does not entail any intellectual sacrifice, but is conducive to an improved mental cultivation of the population. The educational problem, as well as the physiological problem, is, in my view, the reverse of that commonly put forward by educationists: it is not, how long a time, but, how short a time, the children can be kept at school. Instead of sacrificing moderate or duly regulated productive labour to the service of the schoolmaster, in my view the services of the schoolmaster ought everywhere to be conciliated and adapted to the demands of labour at every stage. The establishments where the combined system of short-time school-hours and bodily training is the best administered, the pauper district schools, comprise the most wretched children of the population, and are, in fact, hospitals, where many of them only enter to die of the fatal diseases with which they are stricken. Even with them, however, the death rates are, by sanitary treatment, combining the elements specified, greatly reduced below that of the general population of all ages. The death rate amongst the common average of the children not in actual disease, has, under the combined bodily training and short school-time system, been reduced to one-half the average death rate of children of the same ages. Experienced officers of health agree that it were possible by a full application of sanitary science to prevent nearly one-third of the present slaughter.

The overwork of young children is not confined to any description of employment. We may state it as a proved general rule, that

where they are kept to work—be the description of employment what it may, mental or manual—for the same hours as the adult, they are worked injuriously and wastefully, just as the young colt is when it is made to run the same stage as that which exhausts the ordinary working power of the full-grown horse. The charge of injurious overworking is applicable in its degree, even to employments in agriculture. Mr. Charles Paget, the member for Nottingham, from the testimony he received from manufacturers as to the well working of the half school-time, and half-time work in the factory, applied the half-time system to the children in employment on his estate, only sending them on the alternate days to the school, and employing them in double sets in the fields—with the common result, that whilst the work in the school was improved, the quality of the work in the field was also improved. But what he did not anticipate was, that even these agricultural lads grew up straighter and finer men. He says, "It is a very striking result that the alternation of the school attendance with labour appears to conduce to the bodily improvement of the agricultural lads, who, instead of growing up with the low, heavy, slouching gait which is the result of continuous work, grow up straight, carry themselves well, and look bright and intelligent."

The present insanitary dealing with the working population of the country, in the lowest economical view, is much as would be that of a farmer, who, in order to obtain one working horse, had to rear two colts, while, from mismanagement, the horse reared yielded only one-half the productive labour to be obtained by a better training; for as old horses are not to be obtained from overworked colts, so neither are old working men to be obtained from overworked children.

I have now, as far as the time would permit, and without staying to advert to exceptional and qualifying conditions which do not materially vary the large preponderant results, described the chief insanitary conditions which occasion infantile slaughter: 1st. The insanitary conditions of their homes, which have the principal share in the deaths of 173,000 children under five years of age, in England and Wales, of which 56,000 are reported as having been specifically caused by zymotic or fermenting diseases, which may be called filth, or foul-air diseases, which sanitary measures are proved to be effectual in preventing. 2nd. The imperfect bodily training of children, and their general ill-treatment in the school stage, which aggravate the effects arising from the insanitary conditions of their homes, and contribute largely to the deaths of 59,000 children annually between the school ages of five and fifteen years of age, of which 16,900 are specified as from foul air, or filth diseases. 3rd. Those arising from overwork, or work during the same stages as those of adult labourers. There is a heavy contingent of from sixteen to eighteen thousand deaths in the adolescent stage, or under twenty years of age, the greater proportion of which are due to gross preventible causes; though a portion of these deaths may be due to the set of insanitary conditions in the previous school stage.

Hitherto sanitary science has been only popularly consulted, and

that only in late times, on extraordinary outbursts of epidemic disease, and it has chiefly displayed the preventible sources of disease created by the more prominent insanitary conditions of habitations; but it has yet fully to display those connected with places and processes of work. In respect to one class of artisans, the tailors, I ascertained that a tailor working in a comparatively healthy place in a rural district preserved his eyesight from one-fourth to one-third longer than a tailor living in a town, and working, as is common there, in a crowded shop. My own information enables me to state that sanitary science competently applied could ensure an augmentation of upwards of ten years to the duration of the working ability of the general labouring population of Great Britain, besides adding a large contingent, by the prevention of upwards of eighteen thousand premature adult deaths annually, in addition to the saving which I have recited as derivable from the prevention of excessive slaughter in the earliest infantile, and the school and juvenile and adolescent stages of life, which I have now endeavoured to bring specifically under the notice of the Public Health Section. The effect of insanitary conditions upon population, is not, however, always so much to reduce their numbers—for an excess of deaths is frequently made up by an excess of births—as it is always to weaken the population, by increasing the proportion of dependent hands, and by reducing its working power. The most certain and greatest effect of the general application of sanitary science, would often be in the augmentation of the productive power of the population, by improving its quality and increasing its efficiency. How large would be the value in the aggregate of the augmentation of the efficiency of the labour power of the population of the country—greatly understated, I believe, at one-fifth—by an improved physical as well as mental training in the elementary school stage? The pecuniary saving derivable from the general application of sanitary science to the prevention of the excessive sickness and premature disability and loss of labour in the adult stage, would be found to be upwards of twelve millions per annum. But in the present condition of the country, with its increasing demands for labour, the general application of sanitary science would supply its needs by the augmentation of numerical as well as individual power in the several directions indicated, by preventing excessive infantile sickness and slaughter; by rendering, by means of an improved physical and mental training, the proper upbringing of children, and their entrance into life, less grievous and uncertain; by rendering marriage less wretched than it now is, in fact as well as in aspect—in other words, by rendering it really less improvident than it must be felt to be by better educated persons of the wage classes, and the lower middle and especially the salaried classes;—a large increase of marriages, and a superior addition to the power of the Empire, must be produced. In Great Britain in 1851 the bachelors between the ages of twenty and forty, were 1,428,000; the spinsters were 1,445,000. There were also widows and widowers

between those ages, and, in round numbers, upwards of half a million of spinsters and bachelors above those ages. Of every 100 young men from twenty to twenty-five years of age, 21 were married in England and Wales, and 16 in Scotland. Of 100 young women of the like ages, 31 were married in England and Wales, and 25 in Scotland; thus statistically verifying the popular reputation of the social predominance of the prudential element, in respect to marriage in Scotland.

I do not of course presume that it would be consistent with the occupations of the majority of these, the greater proportion of whom, probably, are domestic servants, to marry; but I deem it probable, that the number of celibetaires, including widowers and widows, of marriageable age, might under fair conditions be reduced by one-third; or in other words, that the drain upon the population might be reduced, by the annual births of some half million of marriages, of comparatively well educated, prudential, and well-conditioned couples who now live in unnatural celibacy. It is for the political and the social economist to estimate the social, and civic, and political influence of an augmentation of such a quality, as well as by the increased proportion of population of persons of mature age and experience obtainable by the prevention of the premature mortality of persons in the adult stages of life.

In respect to the means of prevention, I might accept the dogma, loudly asserted by sects on political platforms, that nothing ought to be done by that public agency the State which the people can do with anything like the same effect, or at anything like same rate of expense, for themselves. But as to the means for the application of sanitary science to the improved physical and mental training of the population, what can "the people," meaning private people in their present condition, do for themselves? In the great mass of the subject-matters of free trade, as in things bought over the counter, if a bad commodity is supplied, it may be readily detected, and no great mischief is done. But as respects the great mass of failures in education, parents, or the pupils themselves, ascertain the default only to deplore it as irremediable. Even as respects the schools of the higher classes—often dispersed by fevers, by measles, by scarlatina, which inflict permanent injury—when injury is done by excessive sedentary constraint alone and the neglect of physical training, what remedy is there, any more than there was for the default of mental training in the 232 out of 437 gentlemen's sons, who from 1851 to 1854 were plucked, for want of the knowledge of common arithmetic, as well as for bad spelling of their mother tongue, when examined for commissions in the army? What remedy is there in the case of young females of the middle classes, for the evils created by violations of sanitary science and the laws of physiology in boarding schools, the consequences of which are only fully made manifest in wide-spread nervous mania, and needless suffering in the married condition in after life? But in respect to the labouring classes, even if they had the knowledge of the real

sources of the evils to which their children are subjected, what means have they of remedy? They must take whatever schooling there may be near their habitations or places of work, be it bad or indifferent—however enervating, mentally or bodily, or morally injurious it may be.

Nay, in respect to private adventure or any schools, separately, there are few that have any means of providing for physical training by drill masters, or swimming masters, or exercising grounds, or swimming schools Is high-seated authority then to be allowed to fold its arms, and under the pretext of a deference to ignorance, will not remove, and do nothing to rescue the children of the working man from such insanitary conditions and evils as have been described? It is one of the important features of this Association that it brings together a most intelligent, impartial, and independent public audience, to the least degree affected by narrow political party or sectarian views. At none of its meetings, neither at Birmingham, nor at Liverpool, nor at Bradford, nor at Glasgow, has the dogma to whieh I have referred received any countenance, in the sense in which it is put forward, either in the general or at the sectional meetings. At Bradford, indeed, where it was brought into controversy by its most strenuous advocates, their ground was pronounced by a large and impartial majority to be untenable.

On the present occasion I trust that I shall have established the claims of sanitary science and physiology to consultation and consideration with those investigated in the great section devoted specially to the means of promoting education. Before the section on jurisprudence, the recognised legitimacy of the legislative and administrative principles (the application of which is requisite for the attainment of the end desired) may be vindicated as essentially popular; and it may be proved that by the administrative combination and improved direction of local educational means, by special and responsible local administrative bodies, the existing expenditure may be made amply to suffice for ensuring to the whole population an improved physical training, together with a superior religious and moral and mental education, in far less time than is now generally occupied with an education of an inferior character.

As a question of social science I have endeavoured to display the prostration of moral and social influences under evil physical conditions. I should have been glad to have been enabled to have traced more completely as a subject of study—especially for politicians, whose profession and duty it is to examine and estimate them—the influence of those conditions on populations, from infancy to the adult stage, and their bearing on the progress of civilization. I have a deep impression, however, that the time is now most favourable for measures of relief for the infantile and juvenile population, and their improved physical training, as being the least opposed by strong sinister interests, by fixed habits, or by deeply-rooted prejudices.

To those specially interested in reformatories and the repression of crime, to those specially interested in the repression of pauperism

and mendicity, and the relief of sickness and destitution, as well as those generally interested in the repression of social disorder, I submit, that the primary preventive measure, for which we ought now to labour in common, is to ensure to the rising generations a sound mind, having for its necessary foundation a sound body, which must be built up and fortified, and made apt for prolonged and less painful use, by improved physical training under the direction of sanitary science.