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ON THE

SANITARY CONDITION

OF THE

BRITISH ARMY;

AND

ESPECIALLY ON THE WANT OF SPACE IN BARRACKS.

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LONDON:
PUBLISHED BY HENRY RENSHAW, 356, STRAND.

1858.

WESTMINSTER:
PRINTED BY J. B. NICHOLS AND SONS,
25, PARLIAMENT STREET.

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From the Journal of the United Service Institution, vol. ii., *pp.* 1–34.

I have sought this opportunity of addressing you, because I wish to acquit myself of some part of that great debt of gratitude which, in common with all who devote themselves to the cultivation of the arts of peace, and who are not wholly insensible to its blessings, I feel that I owe to the brave men who fight our battles by land and by sea. I would fain render some slight service to those gallant men. But my debt to the navy must remain unpaid, because, as I need scarcely tell you, for the last three quarters of a century, since the memorable voyages of Captain Cook, the condition of the sailor in all that relates to the preservation of his health, and the enlargement of his comforts, has been one of progressive improvement, so that it is now scarcely possible for a civilian, like myself, to suggest anything that will conduce to his advantage. Not so, however, with the soldier: for I will undertake to say that there is no man, however ignorant he may be of sanitary science, however little knowledge he may have of the causes which tend to preserve health, or to destroy it; there is no one, how narrow soever his notions

may be of the comforts which men in an humble sphere of life ought to enjoy, who could not, on the most cursory inspection of our barracks, and the most superficial knowledge of the routine of a soldier's duties, point out many things that would conduce greatly to his advantage, and which, if we would not altogether forfeit our old reputation for humanity, justice, sound sense, and true economy, ought, without one moment's delay, to be carried into effect. I do not therefore think that I lay myself open to the charge of presumption in coming before you, as a civilian, to talk to you, soldiers, upon this grave question, and to discuss the contents of the valuable Report which lies upon your table.

This Report, as most of you probably are aware, is entitled "The Report of the Commissioners appointed to inquire into the Regulations affecting the Sanitary Condition of the Army, the Organization of Military Hospitals, and the Treatment of the Sick and Wounded." It is a bulky volume, and contains, in addition to the usual summary and recommendations of the Commissioners, a great mass of evidence, and a very valuable Appendix. The Report is signed by the Right Honourable Gentleman now in the Chair, who has shown himself a true and tried soldier's friend, and who, I hope and believe, will maintain this character to the end of his days. This Report is also signed by several gentlemen, among whom are some of my personal friends. They are all of them men above suspicion, and quite incapable of intentionally misrepresenting or exaggerating the facts that were brought under their notice.

I may also speak in terms of similar commendation of the witnesses who have given their evidence before this Commission, among whom I may also mention that there are several of my personal friends; and I may undertake to say of them that, throughout the length and breadth of Europe, there are not to be found men, in their peculiar line, who could be brought into comparison with them. I speak of Sir Alexander Tulloch, Dr. William Farr, Mr. Neison, Dr. Balfour, and my old friend Dr. Sutherland, with whom I was associated fifteen years ago in sanitary movements and agitations. They are quite incapable of representing anything before this Commission which they did not believe to be true—

they are quite incapable of exaggerating the evils under which the soldier is represented to be labouring.

I may also add that there will be found in the Appendix to this Report a very valuable paper, consisting of answers to written questions addressed to her by the Commission, from the pen of that gentle lady whose presence at the bedside of the sick soldier in the hospitals of the East was felt to be as rays of sunshine in a dark place—I mean Miss Nightingale. And it must be a great satisfaction to the soldier to know that, though she no longer ministers in person to his wants, she is now as deeply interested as ever in his behalf, and is labouring, with all the energy, zeal, and talent of a man, and all the gentleness, tenderness, and constancy of a woman, to promote to the utmost possible extent the welfare of the brave men to whose cause she is so warmly attached.

Now, this Report, to which I have thus cursorily alluded, brings into bold relief one great fact—one distressing and disgraceful fact—that the mortality of our soldiers, especially of the infantry, and more especially of the Foot Guards, is very much greater than that of any class of the civil population, with whom it seemed to be reasonable, and natural, and fair, to compare them. And when you reflect that the army is recruited from a population some of whom are conscious of defects that prevent them from ever offering themselves as soldiers, and others are rejected in large numbers when they do offer; when you bear in mind, too, that great numbers of soldiers are sent back, as invalids or pensioners, to the population from which they were drawn, to be reckoned when they die not as soldiers but as civilians, so as to swell the proper rate of mortality of the civil population, and to diminish, in like proportion, that of the Army, you will be able to appreciate the gravity of this statement.

But this is no new fact; for at page 250 of the second volume of the Journal of the Statistical Society, published in 1839, there is a paper from the pen of Mr. I. W. C. Lever, in which he contrasts the facts contained in the then recent Report of Sir Alexander Tulloch, on the mortality prevailing among our troops during the seven years ending 1836, with similar facts relating to the civil population.

In that publication, the fact that British soldiers, and the infantry more especially, are subject to a very great mortality, as compared with civilians of the same ages, was clearly set forth. I have prepared a table embodying these facts, but, as I shall not have time to comment upon it at any length, I must be satisfied with directing your attention to it.

MORTALITY IN THE ARMY, 1830—1836.

(Annual Deaths in 10,000 living.)

——	All Causes.	Consumption.	Fever.
Household Cavalry	145	81	16
Dragoons and Dragoon Guards	153	77	14
West Indian Depôts	185	96	28
Foot Guards	216	141	17
French Army	195	—	—
Population of Towns, being Military Stations—Army Ages	160		
Population of London—Army Ages	150	Suicides = $\frac{1}{20}$ of Deaths among Dragoon Guards.	
Labourers E. I. C. S.	125		
Metropolitan Police	90		

You will find that the facts embodied in this table, relating to an earlier period of the history of our army, are in harmony with the statements made in this Report of Mr. Sidney Herbert's Commission, though the rate of mortality is higher at the earlier date. But I must invite your attention to one melancholy fact stated in the Table, that, among our Dragoon Guards, no less than one-twentieth of all the deaths was attributed to suicide.

I say, then, that this fact of the great mortality of the British soldier is no new fact. To our disgrace be it spoken, it was known twenty years ago; and eleven years ago (in the spring of 1847) another fact was stated in the House of Commons in reference to our metropolitan barracks, which I think you will agree with me is not unlikely to bear to this high mortality of the soldier the relation of cause and effect. Sir De Lacy Evans told the House that, in the metropolitan barracks, a room 32 feet long and 20 broad, was all the convenience then afforded for the eating, sleeping,

and general living of twenty men and non-commissioned officers, some two or three of the men being in all probability married. Such a room would probably not afford to each inmate more than from 250 to 300 cubic feet of air, or from a fourth to a third of the prison allowance. On the same occasion Colonel Lindsay stated that in one case he had found an allowance of 357 cubic feet, and in another of 330 cubic feet.* Therefore, neither the fact that the life of the British soldier is shortened, nor one of the leading causes to which I shall have occasion to attribute that curtailment of his life, are new to us. We ought long since not only to have known these facts, but we ought to have paid more attention to them.

The precise facts relating to the present mortality of the soldier, as compared with the mortality of civilians, are embodied in an intelligible form in the table before you.

DEATHS PER 10,000 PER ANNUM AT THE SOLDIERS' AGES.

London Fire Brigade (ages 40—60)	70
Metropolitan Police	76
England (Healthy Districts)	77
Agricultural Labourers	80
Out-Door Trades in Towns	85
Navy (Home Stations)	88
City Police	89
England	92
24 Large Towns	119
Manchester	124
Infantry of the Line	**187**
Foot Guards	**204**
Household Cavalry	**110**
Dragoon Guards and Dragoons	**133**

The facts, with one exception, are taken from the Report of the Commissioners. The exceptional case stands at the head of the table, and relates to an important class of men, of whom I shall

* I take this opportunity of stating that some passages in this Lecture are but slightly altered from similar passages in my article on "The Mortality in the Army," published in Fraser's Magazine for April. Having stated this fact, I do not deem it necessary to distinguish the passages in question by marks of quotation.

presently give you some account—I mean the London Fire Brigade. The figures which exhibit the very favourable rate of mortality of this class are followed by those which display the mortality in several distinct bodies of civilians, namely, the Metropolitan Police, the inhabitants of the healthy districts of England, agricultural labourers, men following out-door trades in towns, the Navy on home stations, the City Police, the inhabitants of England and Wales, of twenty-four large towns, and of Manchester; and, by way of contrast, the mortality of the infantry of the Line, of the Foot Guards, of the Household Cavalry, and of the Dragoon Guards and Dragoons. The civilians thus compared with our soldiers are, in all cases, males of the same ages with the soldiers themselves, with the exception of the men of the Fire Brigade, whose ages range from 20 to 60. These men of the Fire Brigade, or London Fire Engine Establishment, occupy the most favourable position in the table. They are subject to an annual mortality of only 70 in 10,000, whereas the Foot Guards suffer a mortality of 204 in 10,000, or very nearly three times as many.

Now, this is the class of men of whom I said just now that I would give you some account. I am indebted for the particulars of their occupation and consequent mortality to Mr. Charles Frederick Browne, the surgeon to the force; and I am happy to see a gentleman here this afternoon (Mr. Braidwood, the superintendent), who can confirm the statements I am about to make.

The ages of the firemen range from twenty to sixty and upwards; and there is one man now in the service in his 70th year, quite able to take his turn of duty with the rest. The men are carefully selected, full three-fourths of them having been man-of-war's men. The duties they have to perform are by no means light; for each man, on the average, has been on duty at the stations, or on the watch on premises damaged by fire, three days and three nights, of twelve hours each, in every week of the past year. This is exclusive of attendance to clean the engines and tools, and keep the hose in order, and of a sort of engine-drill for the younger men twice a-week. The men have also to attend and work at fires, where they are in the midst of intense heat, steam, and smoke, saturated with water, and obliged to stand in elevated situations exposed to severe

and cutting winds, so that the men are often seen in winter literally encrusted with ice. They are sometimes called out by fires, or alarms of fire, as many as four times in a night. But, notwithstanding this hard duty and extreme of exposure, the rate of mortality among the men is highly favourable. For the first thirteen years of the establishment, the deaths were at the rate of 96 per 10,000; while for the last twelve years they have fallen to 70 per 10,000. Both these calculations include deaths by accident, which, in spite of the perilous nature of the employment, have not exceeded 44 in 10,000 in the whole period of twenty-five years. The higher mortality of the early period is attributed, and probably with justice, to less careful selection; but the moderate rate prevailing throughout the whole period of twenty-five years is evidently to be attributed to the unusual care and attention bestowed on the comforts and health of the men, who live either at the stations or in houses provided by the establishment, and subject to careful inspection. The management is in the hands of a Committee, appointed by the several Fire Assurance Offices, who pay the men liberally, give them plenty of warm and comfortable clothing, instruct the Medical Officer and Superintendent to look narrowly to the healthy state of the stations, and the other residences of the men, and act with promptitude and liberality on any suggestions which these efficient officers may please to make. This, I believe, is a fair and accurate account of this very healthy class of men.

Here, then, we have a case of night work and exposure to weather certainly far exceeding in severity the night duty which the foot soldier has to perform; for I understand that the soldier is on guard only every fourth or fifth night. Yet this night-work, and this exposure to weather, being accompanied, in the case of the Fire Brigade, by the most scrupulous care of the health and comforts of the men, is compatible with the very favourable rate of mortality shown in the Table. May not the unfavourable death-rate of 204 in 10,000, prevailing among the Foot Guards, be partly accounted for by the substitution of carelessness for care?

I infer, therefore, that night-work and exposure to the weather do not of themselves occasion the great mortality of the Foot Guards. I infer that a man may have severe night-duty and much exposure

to weather, and yet be long-lived; and this inference is confirmed and strengthened by the favourable rate of mortality prevailing among the Metropolitan and City Police, when compared with the Guards or with the Infantry of the Line. The police are much more exposed to the weather, and have much more night-work, and yet their rate of mortality is far below that of the foot soldier.

Let us next take the case of the sailor. He, too, has a good deal of exposure, and is subject at night to great over-crowding. His diet is also monotonous; and sometimes insufficient in quantity and defective in quality. But the sailor, as compared with the soldier, has a favourable rate of mortality, because, in common with the agricultural labourer, the unwholesome influences to which he is exposed are counteracted by strong and varied exercise in the pure open air.

I will next ask your attention to the class of men I have just mentioned—the agricultural labourers. Their rate of mortality also is given in the Table. Agricultural labourers are a very long-lived class of men. There is no large class of the community that lives so long. And yet these men attain to this longevity, in spite of great exposure to the weather, in spite of great overcrowding in their sleeping places at night, in spite of unwholesome dwellings, in spite of a monotonous and scanty diet, and very insufficient clothing: in defiance, as it were, of several of those evils which are supposed to attach to the condition of the soldier, and to account for his high mortality and short life. I conclude, therefore, that a man may be much exposed to the weather, that he may be greatly overcrowded at night, that he may be ill-clothed and badly fed, and yet, in spite of these unwholesome circumstances, if he have only hard daily labour in the pure open air, he may enjoy good health and attain to long life. The hard daily labour in the open air proves his salvation.

Let us now turn from long-lived men to short-lived men: from men having a favourable rate of mortality, though exposed to the action of certain unwholesome influences, to which, in common with the soldier, they are subject, to men having an unfavourable rate of mortality, due to causes which may also be presumed to contri-

bute to shorten the soldier's life. The class to which I shall first invite your attention is the English aristocracy. I am able to compare their expectation of life with that of the agricultural labourer; and I find that, while the agricultural labourer at thirty years of age has an expectation of forty years and a half, the English aristocracy has an expectation of only thirty-one years. So that between the agricultural labourer, with all his privations and disadvantages, and the English aristocracy, having every comfort and luxury which wealth can purchase, there is a difference as against the aristocracy of nine years and a half. Now I want to draw your special attention to this favoured class, and the circumstances under which they are placed. At first sight, the position of the aristocracy would seem a very enviable one. They are able to guarantee themselves against all the causes which undermine the health and destroy the lives of the poor; but hereditary wealth, whether in the hands of men born in the ranks of the aristocracy or out of them, has this serious drawback, that it creates a great difficulty in finding a suitable, active, vigorous, exciting, interesting employment. Its possessor, therefore, naturally falls into idleness and dissipation, and this, with luxurious living, inevitably shortens his days. This is a very important fact, because it bears upon the mortality of the soldier, and illustrates some of the evils of his condition.

My object in bringing this fact thus prominently forward will at once appear, if I read to you a statement made by Colonel Lindsay in reference to the want of interest which the soldier has in his occupation, and the consequent temptations into which he falls—temptations allied to those that beset the path of the aristocracy, though, as I need scarcely tell you, divested of the element of luxury, of which the soldier has little enough. Colonel Lindsay tells us that the Foot Guards get up at six o'clock, make their beds, clean their things, and get their breakfasts at seven; that they turn out at half-past seven or eight for a drill; but that if it be guard day, there is no drill, except for defaulters. The men for duty are paraded at ten o'clock, and that finishes the day's drill altogether. There is evening parade, which takes half an hour; and then the soldier's time is his own till tattoo,

which is at nine in winter and at ten in summer. This is the day of a soldier not on guard, or not belonging to a company out for Minié practice. Now as to the consequences of this idle and lounging life: "Perhaps," says Colonel Lindsay, "no living individual suffers more than he from *ennui*. He has no employment save his drill and his duties. These are of a most monotonous and uninteresting description, so much so that you cannot increase their amount without wearying and disgusting him. All he has to do is under restraint; he is not like a working man or an artisan. A working man digs, and his mind is his own; an artisan is interested in the work on which he is engaged; but a soldier has to give you all his attention, and he has nothing to show for the work done."

Here, then, we have a graphic description of a man handed over by our military authorities for a prey to listlessness, idleness, and dissipation.

I think, therefore, that, setting luxury aside, in which certainly the foot soldier has no means of indulging, he is subject to the same evils which beset the aristocracy of this and all other countries. If our own aristocracy suffer less from these causes than the aristocracy of other countries, that happy result is due to that love of enterprise, that fondness for work for work's sake, which seems born and bred in Englishmen of all classes from the highest to the lowest. This it is that saves the aristocracy of England from that extreme of degeneracy into which so many other privileged classes in all ages of the world have fallen.

There are still one or two other classes to which I must ask your attention, in order that I may explain my own views of the causes of the excessive mortality to which the soldier is subject. One of the classes to which I allude consists of men who work in-doors with a great deficiency of exercise, at the same time that they inhale a close, heated, and impure atmosphere. This is the case of tailors, and of compositors in printing offices, whose health is destroyed, and their lives greatly curtailed, by these causes. It is the case also of clerks, though they suffer more from want of exercise than from want of air. I might prove my position by figures; but I prefer stating in general terms, that there is no doubt whatever that

the lives of men who are thus employed are shortened by confinement and insufficient exercise. Another class of men subject to a high rate of mortality from causes that affect the soldier consists of those who indulge in intemperance. The brewers' draymen and licensed victuallers are well known to be exposed to this temptation, and are equally well known as very short-lived men. Thus, if we compare the brewers' draymen with the whole body of labourers working out of doors, among whom, of course, there are many intemperate men, we find the draymen's lives so curtailed by this baneful habit that at thirty-five years of age their mortality is double that of the labourers. Similar comparisons between licensed victuallers and the whole body of tradesmen, and between potboys and footmen, give the same general result.

I think that I have now sufficiently prepared you for the study of a tabular comparison, in which I have arranged in one column some of those causes that are usually alleged as shortening human life, and which are also believed to injuriously affect the life of the soldier. The rest of the Table consists of eight columns, four of which have black and four red headings. The first four (those with black headings) are instances of favourable durations of life; and the last four (those with red headings) are instances of unfavourable durations of life.* The stars indicate the presence of the several causes of disease in the classes at the head of the columns.

Cause of Disease.	Agricultural Labourers.	Sailors.	Police.	Fire Brigade.	Aristocracy.	Tailors, Compositors, Clerks, &c.	Draymen, Licensed Victuallers, &c.	Soldiers (Infantry).
Over-crowding, or Want of Air	*	*	. .	. .	. .	†	. .	†
Deficient Exercise . .	. .	. .	. .	. .	. .	†	. .	†
Defective or Monotonous diet .	*	*	. .	. .	. .	. .	. .	†
Inadequate Clothing . .	*	. .	. .	. .	. .	. .	. .	†
Night-work or Night-duty .	. .	*	*	*	. .	. .	. .	†
Exposure to Weather . .	*	*	*	*	. .	. .	. .	†
Intemperance . . .	. .	. .	. .	. .	. .	. .	†	†
Luxury	. .	. .	. .	. .	†	. .	. .	. .
Dissipation	. .	. .	. .	. .	†	. .	. .	†
Insufficient Occupation . .	. .	. .	. .	. .	†	. .	. .	†

* In the annexed Table the two sets of columns are distinguished by a difference of type.

Let us take the several classes one by one, and see what lessons we can learn from them. First comes that long-lived class the agricultural labourers. The agricultural labourer, as I have said, is subject to over-crowding; he has a defective, scanty, and monotonous diet; his clothing is not of the best; and he suffers much from exposure to the weather. Take next the sailor. He is over-crowded in his berth at night; his diet is not varied, and in long voyages is apt to be defective; he has a good deal of night duty, and is much exposed to the weather: still, he does not die off as the soldier does. The police come next in order. They have night-duty, with great exposure to weather; and so have the Fire Brigade, whose case I have brought specially under your notice,—and yet they, too, are not short-lived. The men of the Fire Brigade are very much the reverse.

We now come to the four short-lived classes. We will begin with the aristocracy, whom I have taken the liberty of representing as liable to fall into the twin vices of idleness and dissipation. I speak of them as a class, and of their habits of life, as a rule to which I know that there are many exceptions. But as a class they have not sufficient employment to maintain them in health and vigour, and they are short-lived. My next unhealthy class consists of such men as clerks, compositors, and tailors. They work in close and crowded rooms, and have little or no exercise —and they, too, are short-lived. Then comes the class consisting of such men as are tempted by the very nature of their occupation to indulge in spirituous liquors to excess—the class to which belong brewers' draymen and licensed victuallers. They are intemperate; and they, too, are short-lived. The unfortunate soldier comes last of all, with a star against every cause of disease but one—luxury. It is alleged by those who are now engaged in finding out the causes of his excessive mortality, that he is over-crowded; that he sleeps in a close, confined, and fœtid atmosphere; that he has not such exercise as is calculated fully and freely to develop his frame: that he has a defective and monotonous diet; that his clothing does not afford adequate protection from the weather, especially when he is on night-duty; that he has this night-duty to perform under very unfavourable circum-

stances; that he is given to intemperance; that he is extremely dissipated; and that his occupation is insufficient. Here, then, you have the shortest-lived class of all; and you have all these causes alleged, in explanation, some by one person and some by another, but all of them by persons who have thought upon the subject, and whose opinions are entitled to respect.

From this comparison of soldier with civilian, I now pass to a comparison of soldier with soldier. At the foot of the Table (at p. 5) you have the mortality of the Infantry of the Line and Foot Guards compared with that of the Household Cavalry and of the Dragoons and Dragoon Guards. You see that the mortality of the Infantry of the Line and Foot Guards is much more considerable than that of the Household Cavalry, or than that of the Dragoons and Dragoon Guards. Without entering into the more minute differences existing between the Cavalry and Infantry, in regard to the amount of pay, the class from which the men are taken, the degree of care with which they are enlisted, and minor matters of that sort, I will go at once to the broad differences between them. I know of two such differences. The one is that the cavalry soldier is a soldier and something more. He is a soldier and a groom; and every one who knows what the work of a groom is, knows that it requires a good deal of exertion of the whole body —not simply the contracted and constrained movements of the arms and legs, which make the foot soldier on drill look so much like an automaton, but vigorous movements of the whole frame—good strong developing exercise of the chest and body. The other difference is that the Cavalry have more space by one-fourth or one-fifth than the Foot Guards.* These two advantages, then—vigorous, varied, and wholesome exercise, and greater space in barracks—will go far to explain the very different rates of mortality prevailing among the Cavalry and Infantry.

So much, then, for the mortality of soldiers as compared with the mortality of civilians of the same ages; and so much for the mortality of the Infantry as compared with that of the Cavalry. I have now to speak of the diseases which destroy the soldier's life. There are two classes of disease which are the special foes of the

* See Tables ii. iii. and v. in the Appendix.

soldier, and particularly of the Infantry soldier: namely, epidemic maladies, of which fever is the chief; and diseases of the chest, of which consumption is the most fatal.

One of the great characteristics of fever is that it is a disease of crowds and of crowded places;—of crowded prisons, crowded workhouses, crowded ships, crowded hospitals, crowded camps, crowded barracks. If you confine men in a narrow space, fever will certainly break out among them sooner or later; and it is in such places that it spreads most rapidly from person to person, when it happens to be introduced from without.

Cholera, again, is one of those diseases which finds out overcrowded and otherwise unwholesome places. Accordingly, it found out our barracks in 1849; and we learn from the Report that in some of our barracks it destroyed from twice to more than five times as many soldiers as it did civilians in the surrounding districts. We are told that, while the civil population of East London and Whitechapel lost 54, the soldiers in the Tower lost 100 in 10,000; that, while the civil population of St. Pancras lost 22 in 10,000, the soldiers in Regent's Park perished at the rate of 104 in 10,000; and that, while the civil population of Kensington lost 33 in 10,000, the mortality among the soldiers at Knightsbridge was no less than 175 in 10,000.

The Table, compiled from the paper in the Journal of the Statistical Society to which I have already referred, shows that the mortality from consumption in the army twenty years ago was very considerable. In the Household Cavalry it was 81, in the Dragoons and Dragoon Guards 77, in the West India depôts 96, but in the Foot Guards it was 141 in 10,000. That this sad state of things, though somewhat improved since that date, is not yet remedied, the following extract from the Report of the Commissioners will show. Diseases of the lungs, which in the civil population of large towns cause 58 deaths every year in 10,000, destroy 64 in 10,000 of the Household Cavalry, 66 in 10,000 of the Dragoon Guards and Dragoons, 89 in 10,000 of the Infantry of the Line, and 125 in 10,000 of the Foot Guards; and, when compared with other causes of death, these diseases are found to prove fatal in the proportion of about 54 per cent. in the Cavalry,

of about 57 per cent. in the Infantry of the Line, and of about 68 per cent. in the Foot Guards.

I may state in passing (I shall speak more at length on this point presently) that there is no doubt whatever that over-crowding is one of the most efficient causes of consumption; so that, if fever may be looked upon as the acute disease of crowds, consumption may be considered as their chronic malady. But the dependence of pulmonary consumption on over-crowding will be best discussed when I have asked and answered this question,—Are our barracks and military hospitals over-crowded? I will give you the means of judging for yourselves by stating a few facts relating to different periods of time. You have the Tables before you *—Tables which I have been at some pains to compile from the returns published in the Appendix to the Report of the Commission—but I will read to you the general results.

Let me first remind you again of the statements made in the House of Commons in 1847, by Sir de Lacy Evans and Colonel Lindsay, respecting the disgraceful want of space in some of our London barracks. These statements produced just enough effect upon the House to cause some Member or other to move for a Return of the cubic space in barracks throughout the country, which Return was printed in 1848, and supplied us with some facts worthy of a place at the side of those I have just referred to. This Return gives us examples of barrack-rooms in London used as dormitories and day-rooms by grown-up men (tall, strapping fellows, as many of our soldiers are), affording to each man only 397 cubic feet of air to breathe, and worse cases still of 390, 376, 370, 363, 331, and in the case of a temporary barrack at Kensington, 285 cubic feet. In other parts of the United Kingdom the figures are still more unsatisfactory—still more disreputable. At Chatham and Upnor (I am still speaking of 1847) the Infantry were put upon the miserably short allowance of 220 cubic feet of air per man (the maximum at Chatham was only 350); the Cavalry at Maidstone were doomed to 174 cubic feet; and the soldiers in Dover Castle must have been rotting, like sheep in the marshes, in a filthy atmosphere, measured out at the starvation rate of 147 cubic feet

* See the Appendix.

per man. Scotland was favoured with a minimum supply of 240; but Ireland presented a series of low averages, falling from 228 at Portumna and Mallow to 158 at Rutland.

The average space in the 11 Returns from London was 400 cubic feet; 143 Returns from Ireland yielded the same average; 34 from Scotland gave an average of 432; and 155 from England, 447 cubic feet. This was in the year 1847; and who, with these facts before him, can be surprised at the outbreak of cholera in our London barracks in 1849? Who can be surprised at the prevalence of fever and consumption among our soldiers?

Since 1847, as many as 142 new barracks have been erected, of which 132 are in England; and we have another Return showing the cubic space in the barrack-rooms of these new buildings. Of the whole number, two afforded a space of less than 300 cubic feet, four others a space of between 300 and 350, seventeen others a space of from 350 to 400, and fifty-nine barracks a space of from 400 to 500 cubic feet; in sixty barracks only was the space of 500 cubic feet per man exceeded. The barrack-rooms, properly so called, do not yield an average space of more than 550 cubic feet; and instances are given of such contracted spaces as 308, 306, 303, and even 280 and 270 cubic feet.

Let us now come to the present time, and see what this Report has to say upon the subject. We are first told that the new barracks erected since 1855, when the Barrack Committee held its sittings, afford very superior accommodation to those previously built, but that no important steps have been taken towards supplying the deficiencies of the older buildings; that some of the most serious evils remain still unremedied; that the dormitories or barrack-rooms are very confined, and that in a majority of cases, even the minimum cubic space allowed to each soldier by regulation is not attained, the deficiency in a number of barracks amounting to one-third and in some instances to more than one-half of the space allotted by regulation.

And now mark the contrast afforded by the Scotch pauper and the British soldier. We have it on the authority of Sir John McNeill, that the pauper in the Scotch workhouses is allowed 480 cubic feet per bed, and that this minimum is not only rigidly

insisted upon, but that, the houses being scarcely ever full, it is practically much exceeded ; and, moreover, that the pauper is never in his dormitory during the day. In the soldier's barrack, on the other hand, it often happens that even the regulated space of one foot between the beds (I am quoting the very words of the Report —*one foot between the beds!*) is practically unattained. The Report goes on to say that the barrack-rooms very seldom have windows at the opposite sides or ends of the rooms ; that where ventilators exist they are frequently stopped by the men themselves (of course they are, for you cannot safely practise ventilation in these narrow spaces); that barrack-rooms are occasionally found in the basement of the building, approached by descending steps from the natural surface level—the tops of the windows, which open on one side only of the rooms, being little, if at all, above such surface level—and that in low rooms thus situated a number of men may be found lodged in beds so closely ranged that the side of one touches the side of the other. The result is, that the soldier sleeps in a fœtid and unwholesome atmosphere. This, let me remind you, is just such a state of things as John Howard, to his surprise and sorrow, found prevailing in our prisons in the year 1774 : just such a state of things as the Legislature of that day thought too bad even for the worst of their inmates. But perhaps you will attribute this narrowness of space in our barracks, old and new, to the ignorance of the architects or the perverseness of commanding officers in putting more men into the rooms than they were intended to hold. No such thing. The persons immediately concerned, if they were not obeying the letter, were acting in the spirit, of the instructions they received, as you will see when I tell you that the "Orders and Regulations for the Guidance of the Corps of Royal Engineers and Royal Sappers and Miners at Home and Abroad, revised, by Order of the Master General and Board of Ordnance, to 1st January, 1851," prescribed only from 400 to 500 cubic feet per man in temperate climates, and from 480 (the Scotch pauper's allowance at home) to 600 in tropical climates, with a proviso that in general the maximum space was to be allowed, and for single bedsteads. The Report of the Commissioners recommends 600 cubic

feet to each man. This, you will say, is an extremely moderate allowance; and I hope that the nation which does not think 480 cubic feet too much for a Scotch pauper, and does not grudge 900 cubic feet, with ventilation superadded, to the prisoner at Pentonville, will be able to afford this moderate supply of 600 cubic feet to the English soldier.

Now, by way of contrast, let us see how benevolent persons, moved by motives of economy, and anxious to make a profit by providing decent accommodation for the poorest classes, behave towards their clients. In the year 1848, the model lodging-house in George Street, St. Giles's, was opened with great state and ceremony by His Royal Highness the Prince Consort, who presided at a public meeting held at Freemasons' Tavern. I do not know whether our Chairman was present, but many distinguished persons were there, and all the world heard of it, and seemed to take an interest in it. This model lodging-house was intended to supply the conveniences and comforts of life to the poorest class of the people for the very low charge of four pence a night. For this small sum of money the Society for Improving the Condition of the Working Classes contrived to furnish their lodgers with many comforts and luxuries. There was a separate coffee-room, with a good fire and constant supply of hot water; each lodger had his own sleeping room separated from his neighbours; water and gas were laid on; there was a good kitchen, with facilities for boiling, roasting, baking, and frying; a pantry with a separate cupboard for his provisions; lavatories, a cleaning room, hot and cold baths, and other conveniences which I cannot stop to specify. Now, what cubic space did these gentlemen think it necessary that an honest working man should have to breathe? Why, 542 cubic feet. That is what they gave him. I have worked out the calculation, and it comes to that. So that these excellent people, catering for the very poorest class of labouring men, having an anxious regard to economy, and wishing to establish an example of profitable investment, provide dormitories, to be used only as such, with 542 cubic feet of air to each inmate, while three years later the Board of Ordnance were not ashamed of prescribing from 400 to 500 cubic

feet of air as a fit and proper allowance for the British soldier in barrack-rooms destined to the two-fold use of dormitories and day-rooms.

One word as to the accommodation for married soldiers. It appears from a Return presented to the House of Commons in 1857, that out of 251 stations there were only 20 in which any separate accommodation was provided for married soldiers. When such separate accommodation is provided, it seems to be on a par with the provision made for the single soldier in barrack-rooms. At Dover, we are told that it consists of rooms 12 feet 7 inches long by 7 feet broad and 7 feet high, affording for a whole family a cubical space of little more than 600 feet. At Woolwich, a staff-sergeant with his wife and five children sleep and live in one room, in which all the household labours are performed. In the casemates at Chatham the overcrowding is greater, and the decencies of life are still less regarded.

From barracks let us turn to hospitals, and see what the theory and practice of the Board of Ordnance was in respect of these important buildings. I will begin, as before, with the year 1847. At that time no less than fifteen wards of Military hospitals, in different parts of the country, gave an average supply to their sick inmates of less than 400 cubic feet of air; and the Return contains figures falling by easy gradations from 392 to 385, 365, 357, 348, 346, 344, 325, 324, 286, 264, 256, 243, 236, and 213. The mean of 265 averages, taken in every part of the United Kingdom, is only 643 cubic feet per patient. Now the least average space per patient in London hospitals, as appears from a recent Return obtained by Dr. Balfour, the Secretary to the Commission, is 800 cubic feet; the least from any County hospital, 653 cubic feet; the least from any Naval hospital, 752 feet; but the least cubic space allotted to a patient in any Military hospital is 400 feet, or precisely half the minimum space in any metropolitan hospital. This small figure of 400 cubic feet occurs twice in the 46 Military Returns, and in no less than 19 other instances the cubical space per patient falls short of the minimum prescribed by the Board of Ordnance in 1851. The mean results of all the average measurements are equally unsatisfactory; for while the London hospitals

give a numerical average of 1,472 cubic feet, the Provincial hospitals of 1,075 cubic feet, and the Naval and Marine hospitals of 1,014 cubic feet, the Military hospitals afford to their patients only 658 cubic feet.

I think I have now proved to you conclusively that there is over-crowding in our barracks, that there is over-crowding in the rooms of married soldiers, and that there is over-crowding in our Military hospitals.

Now as to the effects of this over-crowding; as to the consequences of having so little air to breathe. I will begin with some extreme cases, the particulars of which are given in a few words in the table before you. You will please to understand that the height of the parallelograms, on the lefthand side of the table, is in every case supposed to be 10 feet, and the depth 1 foot, so that the areas correspond very closely with the cubic spaces themselves, and present them very clearly to the eye. A second column of the table specifies the scenes of the over-crowding, and a third column the result of it. I begin with the tragedy in the Black Hole at Calcutta—a place that has a special interest at this moment, when our minds are so much engrossed with painful events in India. Of 146 persons shut up in that narrow space, with only about 20 cubic feet of air per head, one-third died in less than three hours, and only 23 were left alive at the end of ten hours. The greater number of this small band of survivors were seized with a putrid fever and died. The next case of over-crowding comprised in the Table is that of Marlborough House, Peckham, the Union Workhouse of the City of London, in which the male paupers of the city were farmed out, from the formation of the union in 1837 till a comparatively recent period. This municipal Black Hole was a sort of shed, 7 feet pitch in the centre, and 2 feet at the sides where the men's heads rested at night; and its dimensions were such as to give to each wretched inmate from 30 to 60 cubic feet of air to breathe. At its fullest, it is said to have held from 90 to 100 men. As the room was 33 feet 9 inches long, and 20 feet wide, it will be easy to calculate the space on the floor allotted to each man. As the number of inmates ranged from 50 to 100, let us take it at 68, and call the length of the place 34 feet. If the men were arranged

EFFECTS OF OVER-CROWDING.

Cubic feet.

20 — Black Hole, Calcutta .... Of 146 persons, 23 left alive after 10 hours. Fatal fever in survivors.

30 to 60 — Marlborough House, Peckham, City of London Union Workhouse .... 130 fever patients sent to London Fever Hospital in one year; one-fifth of total in hospital.

52 — Church Lane, St. Giles'.. Great mortality among children and adults. Fever. Cholera.

84 — Village in Dorsetshire .... Fatal fever.

100 — Parish House near Launceston..... Cholera.

136 — Drouet's Establishment for Pauper Children at Tooting, January, 1849 170 deaths from Cholera in three weeks.

170 — Cambridge Town Bridewell, 1774..... Gaol fever.

202 — Printing Office ..... Consumption.

288 — Christchurch Workhouse, Children's Sick Ward, 1848* ..... Gangrene of the mouth.

Prison allowance 1000 cubic feet.

* In one ward 132 cubic feet. 288 cubic feet is the average of a number of wards.

in two rows, each man must have had exactly 2 feet, or about the width of his own shoulders, to lie on ! Close packing this. Well ! What was the result? The place was a perfect fever factory. It sent 130 fever patients to the London Hospital in one year, being more than one-fifth part of the total admissions. The ratepayers, of course, had a pretty bill to pay for all this—a much larger one than they imagined, or I know how to calculate.

I now come to a case of over-crowding of which a gentleman whom I see present (Mr. Neison) is cognisant, for he, with Colonel Sykes and myself, formed a small committee appointed by the Council of the Statistical Society, to examine the scene of it. I speak of Church Lane, the solitary survivor of the once notorious rookery of St. Giles's. In this miserable lane we found a number of rooms so densely crowded, that the cubic space per person ranged from 93 down to 52 feet. The sickness and mortality prevailing among these wretched people was frightful. We compared the mortality with that prevailing at Islington, and found it double for the first year of life, and nearly sevenfold for the second year. Like Marlborough House, too, the houses of this lane were a perfect fever factory; for in a period of less than seven months 139 persons living in Church Lane were under treatment by the workhouse staff, of whom 88 were ill of fever. One house alone contributed 22 cases of sickness and 14 of fever. The cholera of 1849 also found out this filthy lane, as it did the barracks of our soldiers. In little more than one month the pestilence carried off 29 persons, of whom 17 were inmates of the houses which our committee inspected. This was at the rate of 6 in the 100, while the model lodging-house in George Street, within a stone's throw of Church Lane, with a population also of 100, lost only one man by that disease, and he a man of very advanced age. In another model lodging-house near old St. Pancras Church, there was no death from cholera in a mixed population of 500 men women and children.

The scene of my next case of over-crowding was a house in a village of Dorsetshire, described some years since by the correspondent of the Morning Chronicle. The cubic space allotted to each inmate of the cottage at night was 84 feet, and fatal fever was the result, reducing the family from twelve to eight.

I now come to speak of larger spaces. Before the erection of the Union workhouses, the poor were accommodated in poor-houses or parish-houses, some of which have since been let out for small weekly sums to persons just on the verge of pauperism. In one of these parish-houses near Launceston, the space amounted to 100 cubic feet for each inmate, and in one such house the cholera carried off five victims and dispersed the remainder.

My next example of over-crowding is Drouet's establishment for pauper children at Tooting. The space in the dormitories afforded to each child 136 cubic feet, and that one establishment contributed to the death-roll 170 deaths from cholera in three weeks, in addition to 15 deaths in the workhouses to which the children were removed, and 8 deaths by similar diseases, making a total mortality of 170.

I have been able to extract from Howard's work on prisons one instance (namely, the town bridewell at Cambridge) in which I could calculate the cubic space; it amounted to 170 feet: gaol-fever attacked the inmates, closed the establishment, and proved fatal to three out of the seventeen women confined there.

I have myself examined a number of printing offices in which the space is very limited, and in one of them I found the average space to be 202 cubic feet. Consumption was unusually prevalent there. I have a very distinct recollection of a still worse office than this, in which consumption was so prevalent that it created the same alarm that a contagious fever would have done.

My last case of over-crowding forms one of the worst instances of totally inadequate space recorded by the Poor Law Commissioners in 1848. The cholera was expected, and the Poor Law authorities wanted to know what accommodation the London workhouses afforded for the reception of patients suffering from that disease. One of the worst of many bad cases recorded on that occasion was the case of the Christ Church Workhouse. Its sick wards actually yielded an average of 288 cubic feet per patient; and one of the wards gave only 132 cubic feet for each inmate. In this instance the prevalent disease was gangrene of the mouth, a very fatal and intractable malady. Some external nuisances contributed to this result, but the disease prevailed whatever the direction of the wind. Now, by way of contrast to these cases of over-crowding,

I place, at the foot of the Table, the prison allowance of 1,000 cubic feet. It is usually set down at this figure, but we have it distinctly given in evidence before Mr. Sidney Herbert's Commission by Colonel Jebb, that in Pentonville prison the allowance is 900 cubic feet per prisoner, *plus* ventilation. In the cases I have just commented on, and in the barracks of the soldier, the narrow spaces are either *minus* ventilation, or they are accompanied by attempts at ventilation which the narrowness of the space renders either abortive, or, from the severity of the drafts, highly dangerous.

The cases which I have just been describing are intended to show the baneful consequences of over-crowding carried to an extreme. But I think it fair to infer that very disastrous consequences may, and do, result from much less degrees of over-crowding than these—from such over-crowding as exists in all our barracks at the present moment. But perhaps you will call for some clear case of over-crowding among soldiers, followed by some such consequences as I have been describing. Fortunately I am prepared with such a case, on the high authority of M. Boudin, a French sanitary reformer well known in this country.

"During the period from 1843 to 1847 inclusive, I ascertained," he says, "the existence every year, at the Military Hospital of Versailles, of a fatal epidemic of typhoid fever, raging about the month of October among the sick who came to me from the garrison of St. Cloud. The epidemic had this remarkable feature, that it broke out every year eight days after the arrival of the ex-King, and that it disappeared immediately after his departure from St. Cloud, without ever attacking either the civil population or the officers, or even the *sous-officiers*, though these latter inhabited the same barracks as the corporals and soldiers. The following facts give the key to this pathological enigma. The garrison of St. Cloud in ordinary times consisted of from 400 to 500 men, and had scarcely any sick, but on the arrival of the King the garrison was increased to 1200. The men were then crowded into a narrow and ill-ventilated room, whilst the *sous-officiers*, better fed and less harassed with duty, had always at least one room for two men." This is a striking and an interesting illustration of the efficacy of over-crowding in producing fever.

Now, let me ask your attention to a fact or two with regard to consumption. I want to show you that this disease, too, may be brought on by over-crowding. A gentleman now present, (Dr. Neill Arnott,) in his evidence before the Health of Towns Commission, tells the following instructive story about certain monkeys in the Zoological Gardens. "A new house," he says, "was built to receive the monkeys, and no expense was spared which, in the opinion of those entrusted with the management, could ensure to those natives of a warmer climate all attainable comfort and safety. Unhappily, however, it was believed that the object would be best secured by making the new room nearly what an English gentleman's drawing-room is. For warming it, two ordinary drawing-room grates were put in as close to the floor as possible, and with low chimney openings, that the heated air in the room should not escape by the chimney, while the windows and other openings in the walls above were made as close as possible. Some additional warm air was admitted through openings in the floor from around hot-water pipes placed beneath it. For ventilation in cold weather, openings were made in the skirting of the room close to the floor, with the erroneous idea that the carbonic acid produced in the respiration of the animals, become heavier than the other air in the room, would separate from this and escape below. When all this was done, about sixty healthy monkeys, many of which had already borne several winters in England, were put into the room. A month afterwards more than fifty of them were dead, and the few remaining ones were dying. This room, open only below, was as truly an extinguisher to the living monkeys, as an inverted coffee-cup held over and around the flame of a candle, is an extinguisher of the candle. Not only the warmth from the fires, and the warm air that was allowed to enter by the openings in the floor, but the hot breath and all the impure exhalations from the bodies of the monkeys, ascended first to the upper part of the room to be completely incorporated with the atmosphere there, and by no possibility could escape, except as a part of that impure atmosphere, gradually passing away by the chimneys and the openings in the skirting. Therefore, from the time the monkeys went into the room till they died, they could not have had a single breath of fresh air.

It was only necessary to open, in the winter, part of the ventilating apertures near the ceiling, which had been prepared for the summer, and the room became at once salubrious." I have only to add to this story the fact, that the disease of which these animals died was consumption, to convince you of the fatal efficacy of foul air in producing that disease. The general accuracy of this story was confirmed by a colleague of my own at King's College, (Professor Rymer Jones,) who informed me that similar results followed similar treatment in other animals, with this addition, that when a more liberal supply of air was afforded them, they manifested a somewhat inconvenient increase of appetite. I have no doubt that the same result will happen when our soldiers have a larger supply of air; but I trust we shall be able to afford the increased outlay for food, and shall not grudge it.

You will perhaps object to this monkey-case, and to other analogous facts relating to animals, that they are not quite applicable to the human subject. If so, I am happy to say that I can satisfy your minds. I am able to prove to demonstration, that if you do put men into such narrow spaces as our soldiers are condemned to live and sleep in, they will certainly die of consumption. Several years ago, being struck with the high rate of mortality prevailing among letter-press printers, I went carefully through a great number of printing offices and made the inquiries I am about to describe. I may premise that the compositors, who set up the types, use very little exertion in their employment, and are often pent up in very narrow spaces, breathing a heated and impure atmosphere. The great majority of the men to whom my inquiries were addressed were compositors—a few only were pressmen. I measured the area of the several rooms with the utmost care, and calculated the cubic space to each inmate; and I put a few plain questions to each man—the same questions in each case. I inquired of each man particularly whether he had ever spit blood, and to what other diseases he was subject. The object of this first question will be very apparent to a medical man. Spitting of blood is one of those symptoms which is so common in consumption, and so rare in other diseases, that if we are dealing with a considerable number of persons, and comparing one large group with another, this symptom

of spitting of blood may stand for consumption without leading to any serious error. Now, the results of these careful inquiries are

TABLE X.

TABLE SHOWING THE CONNECTION OF PULMONARY CONSUMPTION AND OVER-CROWDING.

—	Spitting of Blood.	Catarrh.	Other Diseases.	Total.	Per-Centage Proportion. Spitting of Blood.	Catarrh.	Other Diseases.	Total.
104 men having less than 500 cubic feet of air to breathe .	13	13	18	44	12·50	12·50	17·31	42·31
115 men having from 500 to 600 cubic feet of air to breathe .	5	4	23	32	4·35	3·48	20·00	27·82
101 men having more than 600 cubic feet of air to breathe .	4	2	18	24	3·96	1·98	17·82	23·76

embodied in the table before you ; and I look upon them as peculiarly important at this moment, as they seem to form the very key-stone to the arch built up by Mr. Sidney Herbert's Commission. I encountered 104 men unfortunate enough to have less than 500 cubic feet of air to breathe, the average, of course, being much less than that. Now, these men had spit blood at the rate of 12½ in every hundred ; and the same number, 12½, said that they were constantly suffering from what they called colds. I found another body of 115 men who had from 500 to 600 cubic feet of air to breathe, and, therefore, very much more than the first group, of whom some had, as you have seen, as little as 202 cubic feet of air to breathe; and these 115 men, instead of suffering to the extent of 12½ in the 100 from spitting of blood, suffered at the rate of little more than 4 per cent., while the liability to colds fell in nearly the same proportion. Lastly, I found a third group of 101 men who had more than 600 cubic feet of air to breathe, and their liability to consumption was still further reduced to a little less than 4 per cent., and their liability to colds to a little less than 2 per cent. If I had more time, I could give you two or three other comparisons of the same kind, leading to the same result.

I do not think that there is any fallacy about these facts. I can

answer for it that I did not make these observations and calculations with the most remote desire to arrive at any particular result, but only to ascertain the truth. I speak therefore with the utmost confidence when I say, that if you will limit men in the quantity of air that they have to breathe, and bring it down to such low averages as you have in your barracks, and, especially, if you do not provide sufficient exercise for them, you will inevitably have a great deal of consumption. I may mention, by the bye, that the fine dust from the sanded floors of the barrack-rooms, and the dust of the pipe-clay from the belts, gloves, and white jackets of the Guards, are not very favourable to men with weak lungs.

I have thus demonstrated to my own satisfaction, and I trust to yours also, three leading facts : First, that a very high rate of mortality prevails among our soldiers generally, but especially our foot soldiers ; Secondly, that our barracks and hospitals are greatly over-crowded ; and, Thirdly, that this over-crowding issues in fever, cholera, and such like diseases on the one hand, and diseases of the chest, but especially consumption, on the other.

It is now time that I should think of bringing this Lecture to a close. I have given you a mere outline of a very great and very grave subject. I have displayed the facts of the case as clearly as I could, and I have to the best of my belief explained the causes. I would again and again insist on the two great evils of over-crowding of barracks and hospitals, and the want, considering the class of persons with whom we have to deal, of sufficient exercise. I do not expect—I have no right to expect—that all those whom I have now the pleasure of addressing should agree with me as to the causes which give rise to this high mortality of our soldiers. The only agreement that I seek for is a hearty determination to co-operate, according to our respective opportunities, to bring it about that the state of things described in this Report shall exist no longer.

But if there is any one now present who attaches special importance to one of the alleged causes of the soldier's mortality rather than another, let that man exert himself to get that evil remedied. If any one thinks that the figures which represent that mortality are not strictly accurate, let him do all he can to obtain weekly

returns of the deaths and attacks of sickness occurring among all our troops in the United Kingdom; and let those weekly returns be compared minutely and carefully with the deaths among the civil population of the soldiers' ages, that we may know the truth, and know it in such good time as to be able to act upon it; so that whenever any military station is found to be subject to an unusual mortality, some skilful person may be despatched to investigate the cause of it, and, within certain necessary limits of expense, to rectify it. Let us also have similar returns from foreign stations at as short intervals of time as possible.

If there is any one here who objects to the soldier's clothing as a cause of disease, let him exert himself to bring about a reform in that respect. If any man thinks that the food of the soldier is monotonous, and the means of cooking it insufficient, let him do all he can to promote a more rational state of things. Do not let it be said that, whereas the poor in our lodging-houses can cook their food as they please, the British soldier is condemned (as far as the barrack-kitchens are concerned) to a nauseous monotony of diet. But to come to more important matters. If any one thinks that night-duty is the cause of the mortality of the soldier (and with the facts I have brought forward respecting the Fire Brigade and the Police staring him in the face it is impossible to allege that night-duty as such is fatal to life), let him find out what unnecessary accompaniments there are which make that duty as performed by the soldier injurious, and then let him exert himself to set that matter to rights.

If any one thinks with me, that the mortality among the Infantry is due in no inconsiderable degree to want of proper exercise, let him agitate for improved drills. Let every soldier be taught the sword exercise; or, if it seem inexpedient to increase his drills, let him be encouraged to take every kind of manly exercise: let every barrack have a covered space, to which the soldier may retreat in bad weather, and find the means of indulging in athletic sports.

In country barracks a cricket-ground ought to be a *sine quâ non*, and I do not see why some modified system of allotments should not be carried out, so that the soldier might have the whole-

some labour of the farm or garden, with the stimulus of profit to induce him to work. If we were wise, and dared to raise ourselves above routine and prejudice in this matter, we should keep the soldier as much as possible in the condition of the agricultural labourer, whose duration of life I have shown to be so favourable.

Then, with regard to dissipation and intemperance—if it be true that the soldier is a dissipated and intemperate man, there can be no doubt that his health will suffer most seriously from those causes. Let him therefore who thinks so, do his very utmost to create and bring into play the largest possible amount of counter-attractions to the temptations to dissipation and intemperance which are known to assail the soldier.

But if any one thinks, as I do, that the first and greatest cause of the high mortality of the soldier is the wholly insufficient space allotted to him in barracks and in hospitals, then let him give his whole heart and soul to this vital matter. Let us hear no more about the ventilation of the present buildings; let us have no pottering experiments to bring fresh air into these narrow spaces. You cannot safely and efficiently ventilate them. But let us do all we can, individually and collectively, to cause the Legislature of this country to make a large and liberal vote of money. It is a mockery to attempt to do anything without it. We want the money from the House of Commons; and if any man thinks that the money is not to be had, it is for him and for us to take those steps by which the House of Commons may be brought to a sense of its duty.

Lastly. If there is any man here so entangled in the meshes of red tape that he cannot stir himself—so tightly bound in the fetters of routine that he cannot move till released by precedents, I will give him precedents. I tell him to look at the case of the sailor. For three quarters of a century, as I have already reminded you, the condition of the sailor has been in constant course of improvement. His case ought to be precedent enough; but if you want a case of such convincing cogency that no man of common humanity and common sense will dare to gainsay it, I will give you the case of the prisoner.

Three quarters of a century ago, also, John Howard brought

before a Committee of the whole House of Commons (not a small Committee like that whose Report we have been considering, but a Committee of the whole House) facts relating to the condition of the prisoner, bearing, many of them, a much closer resemblance than it is pleasant to think of to the barrack revelations of this Report; and the House not only gave him a vote of thanks, but that very year passed two Acts which liberated the poor prisoner (for he was often a debtor merely and not a culprit) from the evils under which he was suffering—from illegal fees on the one hand, and from the perils of the gaol-fever on the other.

But if any man is sceptical as to the reality of sanitary science, and the power given to us of preserving health by simple means, I would ask him to go back to that same period (three quarters of a century ago) when Captain Cook demonstrated, by the example of his voyages round the world, that the sailor's life might be preserved from scurvy, and the other fatal diseases which afflicted him. I would remind him how triumphantly John Howard proved that gaol-fever might be rooted out by the same means which we are now invited to apply to our barracks; and how Jenner proved to demonstration that, if men would but consent to use the boon which Providence had enabled him to place at their disposal, the small-pox might be driven from the face of the earth. Such cases as these ought to satisfy the most sturdy stickler for precedents. Three such cases, occurring as they did in the same quarter of a century of our eventful history, would be enough in themselves to constitute the glory of any nation but this. I say that you have precedents enough. The sanitary history of the army itself abounds in them. But if we must have another precedent, we shall find it ready to our hands in the contrast afforded in the Crimea between the frightful effects of negligence, carelessness, and incompetency in the management of affairs, and the happy state of things brought about by their opposites.

And now I shall take the liberty of addressing you in the language of entreaty. I do beseech you, by the glorious military history of England; by all that our soldiers have done and suffered for us in times past; by the triumphs and trials of the Crimea and of India;—I entreat you by your recollections of the heights of

Alma and Inkermann, of the plain of Balaklava, of the trenches of Sebastopol; by the siege of Delhi; by the defence and relief of Lucknow—but, above all, by the recollection of that scene on the deck of the burning "Sarah Sands"—and, above and beyond all, by that sublime scene on the deck of the sinking "Birkenhead," before which the noblest deeds of ancient heroism sink into insignificance, and to which the glorious annals of Greece and Rome afford no parallel,—I entreat you not to leave this place with hearts untouched, and resolutions half formed;—I beseech you to join hand and heart in one great effort to obtain justice for the British soldier!

For myself I must say that I did not come here simply to state facts and figures, and offer explanations of them. I did not come here merely to solve a difficult problem in sanitary science. I cannot consent to view those figures as mere lifeless sums in arithmetic. I know that every unit represents a scene of individual suffering—a death by fever, cholera, or consumption—which it was our duty to have rendered unnecessary. I came here for a very different purpose. Just as men with their hearts full of private sorrow seek a solitude wherein to weep, so I, with a great public grief pressing heavily upon me, have chosen this time and place to give vent to my feelings of surprise, sorrow, and indignation, that in the middle of this nineteenth century, in this year 1858, such a Report as the one which now lies upon your table should have been possible. In this matter, if in no other, I have obeyed the dictates of my conscience—Liberavi animam meam. I have paid the first instalment of my debt of gratitude to the noblest and bravest army that ever rallied round the standards of a careless, indifferent, and too often ungrateful, nation.

APPENDIX.

TABLE I.—BARRACKS COMPARED WITH WORKHOUSES, MODEL LODGING-HOUSES, AND PRISONS.

Least space,	England,	before 1847	147
Ditto	Ireland	ditto	158
Ditto	Scotland	ditto	240
Ditto	London	ditto	331
Average	London	ditto	400
Ditto	Ireland	ditto	400
Ditto	Scotland	ditto	432
Ditto	England	ditto	447
Least space,	England,	since 1847	270
Ditto	Ordnance Rules, 1851		400* / 450
Greatest space	ditto	ditto	500
Least space recommended (Mr. Sidney Herbert's Commission)			600
Scotch Workhouses			480
Dormitories, Model Lodging-houses, 1848			542
Prisons at Pentonville, with Ventilation			900

* 400 cubic feet is stated as the minimum in the Appendix to the Report, but 450 cubic feet is often mentioned as the Ordnance minimum, and for that reason is here inserted.

TABLE II.—BARRACKS, 1847.

Number of Returns.	Barracks.	Cubic Space. Maximum.	Minimum.	Mean.
30	Cavalry	1052	174	470
30	Infantry	536	219	382
	Difference			88

Cavalry Barracks more spacious by nearly one-fourth (23 per cent.)

TABLE III.—NEW BARRACKS SINCE 1847.

Number of Returns.	Barracks.	Cubic Space. Maximum.	Minimum.	Mean.
9	Cavalry	729	486	613
35	Infantry	682	425	512
	Difference			101

Cavalry Barracks more spacious by nearly one-fifth.

Table IV.—Infantry Barracks (London).

—	Cubic Space.		
	Maximum.	Minimum.	Mean.
1847	429	285*	371
Built since 1847	607	426	489
	Difference		118

* Temporary Barracks.

Table V.—Cubic Space in New Barracks since 1847.

—	Cavalry.	Infantry.	Difference.
Preston	683	544	139 = $\frac{1}{4}$
Sheffield	654	605	49 = $\frac{1}{12}$

Table VI.—Military and other Hospitals, 1857.

—	Cubic Space.		
	Maximum.	Minimum.	Mean.
10 London Hospitals	2426	800	1472
20 Provincial Hospitals	1625	653	1075
5 Naval and Marine Hospitals	1340	752	1014
46 Military Hospitals	1143	400	655