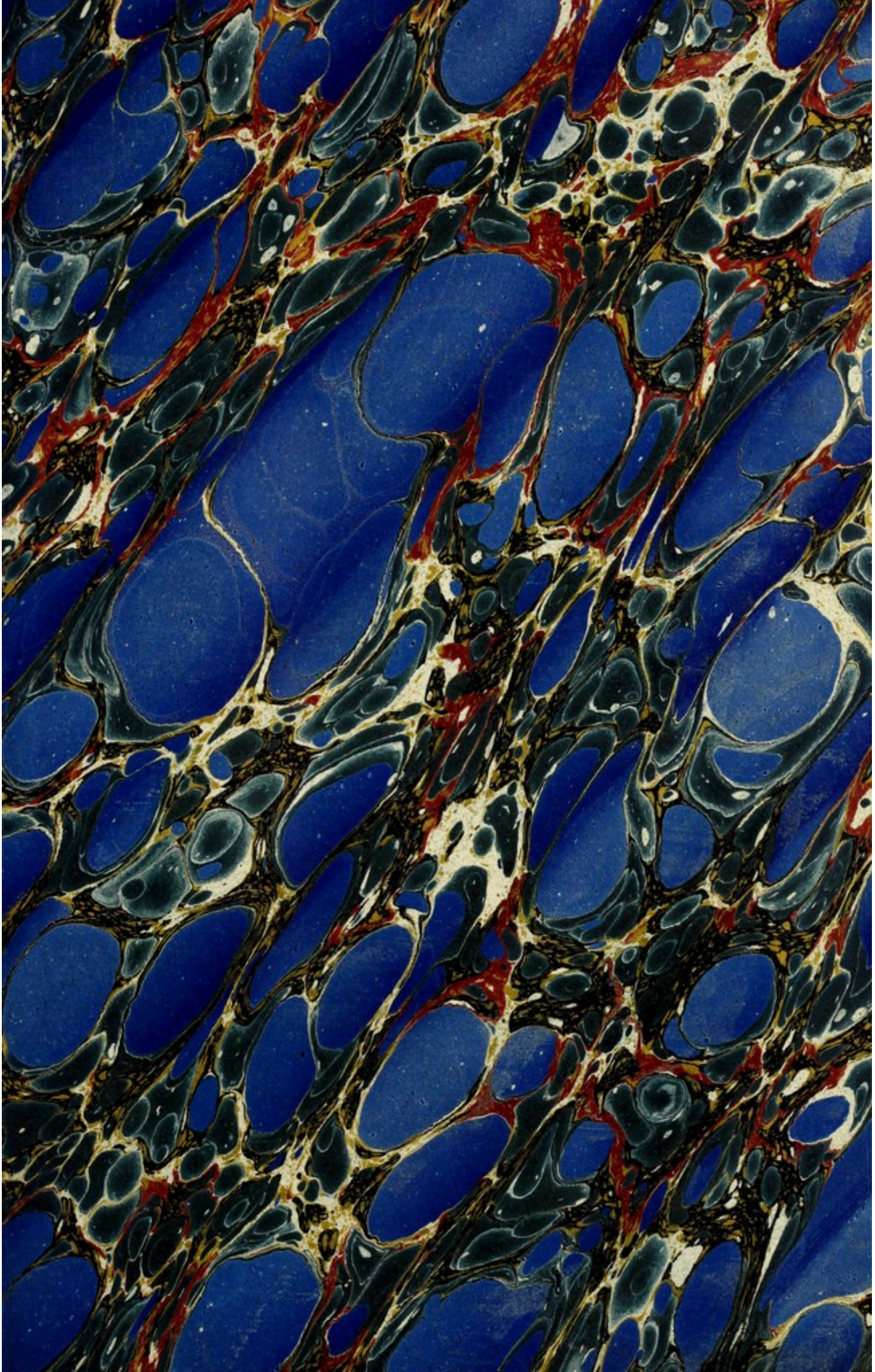
The sanitary condition of the Army / by Sidney Herbert.

SIDNEY EDWARD BOUVERIE BOUVERIE-PUSEY.



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OF

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BY

THE RIGHT HON. SIDNEY HERBERT, M.P.

REPRINTED FROM THE "WESTMINSTER REVIEW" FOR JANUARY, 1859.

LONDON:
JOHN CHAPMAN,
8, KING WILLIAM STREET, STRAND.

1859.

LONDON:
SAVILL AND EDWARDS, PRINTERS, CHANDOS STREET,
COVENT GARDEN.

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SANITARY CONDITION OF THE ARMY.*

ENGLAND has always been jealous of standing armies. In their long struggles for freedom, the people have found how important it is that they, as well as the Sovereign, should have a hand on the hilt of the sword of state. Even when the relations of the governor and the governed have been at the best, the latter seem never to have lost sight of possible contingencies, and took care that, in case of recourse to the *ultima ratio*, no danger should arise from any incautious confidence in quiet times. A large home military force, maintained irrespective of foreign enemies or foreign apprehensions, imbued with a thoroughly military spirit, and animated by a devotion to their colours, in which the sense of citizenship is altogether lost, is what we never have seen in this country, and probably never shall. We have maintained large armies abroad, in foreign wars—large armies at home, to resist apprehended invasion—but the former were not standing armies, for they ceased to stand from the moment that peace was attained; and the latter were composed chiefly of militia, who have always claimed to be the parliamentary, or people's army. It is true that this distinction is a good deal lost, simply because the Queen's army—voted by parliament, paid by parliament, disciplined, distributed, and governed by ministers responsible to parliament—has lost its character as the personal instrument of the Crown, and has accordingly ceased to give ground for jealousy or apprehension on the part of the people. We still object to large armies, but on other grounds. Of our two great services, the navy is the popular one. As islanders, our first and best defence must always be on the water. It is not till that line is broken through (and woe betide the day!) that our safety can depend on trained battalions. Again, it is by sea only

* *A 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, with Evidence and Appendix.* (Presented to both Houses of Parliament by command of Her Majesty.) London. 1858.

that our vast colonial empire can be defended. It is on the sea that our unnumbered merchant vessels, scattered over every ocean, require protection. It is on the sea that our greatest, because most undivided glory has been attained. Our interest as traders, and our vanity as a martial nation, alike combine to make the sea-service our *decus et tutamen*. The standard of both our services is kept within limits by economy; for being an industrial people we are also a thrifty people; we grudge men to unprofitable employments, and we do not like expenditure, because we do not like taxes.

But for the reasons above stated, when the pruning-knife is applied, it is the army that is first reduced. We have ceased to fear it for our liberties, but we fear it for our pockets. We feel, too, that large armies have their temptations to ministers. They have before now been the origin, as well as the instrument, of a captious, arrogant, meddlesome, "spirited" foreign policy, which diverts public attention from domestic reforms, for which, may be, the minister has no stomach; and little bullying piratical wars are undertaken, to justify the retention of a large force. An ambitious minister, particularly if a popular one, requires under these circumstances to be kept low. It is unnecessary to give further reasons why our standing army will always, probably, be a small one; and the fact that it is raised by voluntary enlistment alone, is a reason why its numbers cannot be rapidly augmented.

But in proportion as it is small it ought, if on that account only, to be as efficient as care and discipline can make it. We would compensate by efficiency for want of numbers. What we have we must have of the best material, worked up into the most highly-finished and enduring article; for our army is a nucleus, and there must be in it skill and efficiency to spare, enough indeed to leaven the accession of mere brute force, which alone upon an emergency we can add to it.

This is not the place to discuss the relative value of compulsory as against voluntary service. For the purpose we have in view, it is sufficient to state the fact that, whatever be the case with the militia, for whom by law, though not now in practice, we have a conscription, we have none for the regular army. We cannot afford to spend our men as Continental monarchs can, who know that every stroke of the pen will set in motion another decimation of the peasantry, which will be equivalent to so many thousand men. We get our men with difficulty, by every kind of cajoling and inducement we can devise, and in our necessity descend to those means which men do not have recourse to till they think all others are exhausted. We cannot then afford to waste our men, but as we want to use them, we must learn to husband them.

Of all the causes or means of destruction to which the profession of arms exposes mankind, that which ranks lowest in point

of blood-guiltiness, consists of shot, shell, bayonet, and sabre. The actual destruction effected upon one another in fair fight, in the field, by contending armies, is as nothing. That which destroys an army in the field is disease; superinduced by exposure, by fatigue, by insufficient and unwholesome food, by insufficient clothing, by want of cleanliness in camp and in person, by ill-chosen sites for encampments, by crowding in insufficient buildings in towns,—in short, partly by necessity, but partly also by ignorance, and by a kind of traditional disrespect for precautions, and indifference to all but the more stirring but less fatal risks attendant on collision with the enemy.

The greatest commanders have always been great precautionists, and have habitually entered into the minutest details connected with the preservation of the health of their men. The Duke of Wellington said if he knew anything he knew how to feed an army; no mean matter when health is to be preserved; and his quick observation and intuitive sense soon made a sanitarian of him. Napoleon, who, perhaps, was the greatest general the world has seen, epigrammatized his experience of the means of strategic success in the well-known irreverent form, "Le bon Dieu se range toujours du côté des gros bataillons." And his whole object was to produce his *gros bataillons* in the best possible condition at the decisive moment. He bestowed much thought therefore on the preservation of his army in the intervals between fighting. Not from humanity but from calculation; for he would sooner bury his men when once sick, than treat them; inasmuch as sick men take the pay and consume the rations which would maintain sound men in their places. But even Napoleon lost far more men out of action than in it. The Russian campaign of 1812 was a signal instance of this; for, though he fought one of the bloodiest battles on record since the use of gunpowder, the killed and wounded make but little show in the wholesale destruction which mismanagement brought upon the "*Grande Armée.*" The statistics of that campaign are so curious that they deserve to be reproduced. The policy of Napoleon, as admitted or rather held up to imitation in his correspondence with his brother Joseph, was always to magnify his forces before battle, in order to intimidate the enemy and encourage his own men; to underrate his losses for the same reasons, and, for the heightening of his own success and reputation; and lastly, to lay the blame of failure on anything and anybody except himself. The popular belief still remains extant that the *Grande Armée* consisted of 400,000 men, that there was a great victory at Borodino, and a triumphant march to Moscow, but that the army was subsequently destroyed by the rigours of a winter unusually rigorous even for Russia. Now the "*states*" of the *Chef d'Etat Major* quoted by Carnot, who was war minister, give the numbers of the invading army which

crossed the Niemen on the 24th of June, at 302,000 men and 104,000 horses. On the advance to Moscow was fought the great battle of Borodino. In this battle there were put *hors de combat*, that is, killed and wounded, on the side of the Russians no less than 30 generals, 1600 officers, and 42,000 men. While the French, according to Marshal Berthier's papers, subsequently taken at Wilna, had in killed and wounded 40 generals, 1800 officers, and 52,000 men. The French, however, claimed the victory, inasmuch as the Russians fell back after the battle, and left the French in possession of the ground.

The cold began on November the 7th; but three days before the cold began, namely, on the 4th of November, there remained of the mighty host that had crossed the Niemen but 55,000 men and 12,000 horses; 247,000 men had perished, or become ineffective in 133 days. Of the 55,000 men, however, *plus* any reinforcements they may have met on the way, 40,000 returned to France, showing how few men were lost in that masterly retreat, either by the severity of the winter or the harassing attacks of the enemy. But even if three-fourths of the wounded at Borodino had died, and allowing for those killed in minor actions and operations, there would remain nearly 200,000 men who perished by insufficient commissariat—by want of forethought. The Count de Ségur, the historian of this campaign, considers that the genius of Napoleon had culminated before he undertook this expedition, famous among the world's disasters, and that constant prosperity had led him to look on success as so certain that he neglected the means of attaining it. Any way, here is an instance under the greatest of generals, that it is not the enemy, however numerous or skilful, who effect the destruction of armies. It is fatigue, exposure, want of food, want of shelter, want of clothing, want of sanitary prevention.

We cannot enter now into the question how far this is remediable—how far energetic precaution may counteract, in part at least, the ill effects of risks which must be encountered. That they must be encountered, and that war must be more or less destructive of armies apart from collision with the enemy, is obvious; but the question arises, why should peace too be destructive of armies?—why, when there need be no exposure, no fatigue, no deficiency in food or clothing, no exceptional circumstances whatever, should the profession of arms entail on those who adopt it a higher rate of mortality than almost any other profession?

No argument can be so eloquent as the figures which give the comparison of the mortality of different avocations, and different localities, with that of the army. In order to avoid fractions, we have taken the number of deaths of 10,000, instead of 1000 men:—

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
Twenty-four large Towns	119
Manchester	124
Infantry of the Line	187
Foot Guards	204
Household Cavalry	110
Dragoon Guards and Dragoons	133

And yet these facts, appalling as they are, and unaccountable as at first sight they seem to be, were established beyond a doubt twenty years ago by Colonel Tulloch, who, by command of the War Office, then administered by the present Lord Grey, compiled from the Regimental Returns some admirable tables, showing not only the absolute but the comparative mortality of the army at home. Mr. Hume moved for the returns, and they were laid on the table of the House of Commons. But there the besetting sin of the veteran reformer left them. His diffusion over many subjects left the greater number uncompleted. He was content to rest when he had got that which he was always asking for, "information," and it remained useless because unused. The world in general knew little, perhaps cared little, about the matter. The subject was dry; the figures looked repulsive; and no recent military successes, or military disasters, had fired the imaginations or roused the indignation of the public—so the matter slept.

Later events have excited the popular interest and the popular sympathy with the army. We have felt anew the responsibilities of a nation towards those to whom we entrust the defence of our soil and our honour. While in this mood the report of the Royal Commission on the Health of the Army was laid before Parliament. It was eagerly taken up by the Press. It was extracted, abridged, analysed, commented on, and excited a marked interest among all classes of society. This was not owing to any discoveries made by the Commissioners, for they did not affect to have made any, but their report showed knowledge of detail, a conscientious and rigorous examination of facts, a careful abstinence from exaggeration, and a brevity in statement, which tended greatly to popularize the subject. The report also derived authority, not only from the composition of the Commission, but from the names of the witnesses who were examined, and on whose

evidence the Commissioners founded their conclusions. The only fear was, that the almost universal assent with which the report was received, would be fatal to the practical adoption of its recommendations; that the subject would die out for want of controversy, and, in the silence of universal consent, that the pressure would be wanting which would set in motion the cumbrous torpor of the vast department on whose action the adoption of the reforms indicated must depend. The English people, however, cannot afford to let this subject die out; and it is only by discussion that they can maintain their property in it. Large administrative offices, if inclined to shelve a question, have wonderful facilities for doing it. It is done without parade or ostentation, with a respectful silence, but the interment is none the less complete. Other subjects arise, which however ephemeral in their character, have an interest for the hours during which they last, and the public gaze is diverted from the graver matter which is kept in the background.

We confess, then, that we left this subject, when last we had occasion to treat it, with considerable misgiving as to its future. Its success seemed to be its danger. Nothing was yet done. It was the success of an essay, not of an act; the advice had been admitted to be sound, but it had not yet been followed; the prescription was good, but it had not yet been taken, nor even as yet made up.

We promised to revert to the subject, and it is well in doing so to take stock of the progress, if any, made in the interval.

Believing, as we do, that a strong continuous expression of public opinion is the true motive power to impel to action public offices and public men, and holding, as we have said, that without the fuel of controversy the continuous fire of public opinion cannot be maintained, we have rejoiced to see that the conclusions of the report have been subjected to question, attack, and contradiction, by opponents more or less formidable. There can be no doubt that the cause of army sanitary reform derived a fresh impulse from the onslaught made by the Guards' officers in the House of Commons on the figures which represented the mortality of the Guards not only as more than double that of the civil population, but as exceeding that of any other corps in the whole army. The officers disbelieved the fact, and the history of their disbelief is curious and important too, as showing how great is the disadvantage under which the regimental authorities, medical as well as combatant, labour for want of a good system of military statistics, and the constant promulgation through all corps of the results as affecting the whole and all the component parts of the army.

The Guards' surgeons, it is said, had counted up the deaths in the respective hospitals, and found the numbers less than those

given by the Royal Commission as the mortality of their regiment; but they forgot the men, and they are not few, who die out of hospital and on furlough, the practice, it appears, being to give leave of absence to those poor fellows whose lung diseases are confirmed, whose cases are hopeless, who yearn for home, and who are humanely allowed to go and close their eyes among their own kith and kin. The medical officers had thus misled the Parliamentary Guardsmen; but the error being discovered before the return was presented to Parliament, a corrected edition was finally produced which established the accuracy of the statistics on which the arguments of the Royal Commission were founded.

The statistics, therefore, now stand much better than if they had never been questioned, but the error of the Guards' medical officers bore excellent fruit in other ways. First, all the officers, medical and combatant, were induced to look closely into the facts. They began an investigation which turned out far more serious than they expected, and which they will not now abandon, for it is an error to suppose, as some people seem to have assumed, that there is among the officers of the Guards an indifference to the welfare of the men. On the contrary, it was remarked by more than one intelligent observer in the Crimea, that the personal relations between officers and men were perhaps on a better footing in the Guards than in the Line, partaking less of the austerity of discipline, and showing more individual interest in the men. But habit and ignorance make all men in all professions wonderfully acquiescent in evils which, if once known and felt, are remediable. If any one two years ago had told a Guards' or a Line officer that the mortality in the respective corps was twenty or eighteen in a thousand, he would have told them that which they did not know, but which would have made no great impression on their mind. They would have taken for granted that the rate was about that incidental to adult males of the same ages under any circumstances, and everything would have gone on as before.

Some discussion, however, next arose as to the order of precedence in which the causes of this mortality, as assigned by the Royal Commission, ought to stand. The report enumerates over-crowding in barracks, combined with want of ventilation, sometimes with defective sewerage, night duty, want of variety in exercise, and want of employment, and, lastly, as the result of the latter, dissipation and excess, as the main causes of the fearful mortality which thins the ranks of the army in England.

The Commission seemed disinclined to attach any great importance to night duty, and adduced the example of the police, who perform much severer night duty than is ever required from soldiers, with a far lower rate of mortality. This comparison

was objected to, on the ground that, though the mortality of the Guards and the corps of the army which habitually perform the most night duty was greater than in the police, yet that invaliding is less in that corps than in the police, provided all the discharges in the former case and all the resignations in the latter, are included under the general term of invaliding; the fairness of this objection appears, at least, doubtful, the resignations in the police being very numerous, and to be attributed, no doubt in many cases, as also the discharges in the army, to other causes than the failure of health. Taking a mean, however, between the metropolitan and city police, and adopting this mode of comparison, the difference between that force and the Guards probably would not amount to much. We object, however, to the comparison, on the opposite grounds, namely, that there is no parity, either as to the frequency or duration of the night work done. The night duty of the policeman lasts eight hours, and is given every night in the week, till the term of his furlough comes round—that of the soldier is stated at the utmost, if it be taken at three nights in the week, and four hours in the night; indeed, with the larger battalions we have maintained of late years, it might be stated as low as two nights in the week. Those four hours are not consecutive, but are divided into two spells, of two hours each, with two hours' interval, spent on the guard-room plank bed; whereas the policeman is on his legs, in all weathers, without intermission, every night for eight consecutive hours. Clearly, if the mortality and invaliding corresponded with the duty, the deleterious nature of which is insisted upon, the police would die or be disabled at a rate much exceeding that of the Guards. The same objection applies to a case much stronger than that of the police, and for which we are indebted, not to the Commissioners, who seem to have been ignorant of it, but to Dr. Guy, who quotes it in his lecture on the sanitary condition of the army, delivered in 1858, at the United Service Institution, namely, that of the London Fire Brigade, the details of whose service were communicated to him by Mr. Braidwood, who is the superintendent:—

"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 men-of-war's men. Each man, on the average, has been on duty 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 also 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, 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. 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.

"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, but being accompanied by the most scrupulous care of the health and comforts of the men, it 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?"

The very pertinent question with which Dr. Guy concludes his description of the service and health of the firemen was answered by anticipation by the officers of the Guards, who pointed out that the policeman, with his well-spun cloth coat, his sound boots, his oil-skin cape, was far better protected than the soldier, who came every two hours into the ill-ventilated guard-room where, in bad weather, his wet clothes were steaming in the close and heated atmosphere, till his turn came again to leave that vapour-bath and plunge into the cold and wet to pace up and down for another two hours, opposite his sentry-box. Truly, it is not the night duty, but the way in which it is done, which kills the men. The extreme length of the duty performed nightly by the police appears most questionable, and would fully account for the greater mortality of the night than of the day force; but the description given by military witnesses of the soldier's night duty, shows that, though far less trying to the strength, human ingenuity could scarcely devise a system more trying to health. Are spongy clothes, absence of waterproof, and frequent and violent alternations of temperature, indispensable to discipline? And cannot the good sense of the military authorities devise a remedy for evils which appear to have no compensation, and from which no earthly being derives advantage? So far as the Guards are concerned, the public has taken up the subject of their peculiar mortality, with great and not unnatural interest, since they garrison our metropolis, and are a corps whose magnificent appearance and perfect discipline is ever under our eyes; but the Royal Commissioners, dealing with the army as a whole, suggested remedies as for the whole, and contented themselves with pointing out the higher rates prevalent

in the Guards, without attempting to account for them. Indeed, the President of the Commission stated frankly in the House of Commons, that he for one could not account for them; he only showed that it was not, as had been stated, the result of greater sexual debauchery than in other corps, for he showed that their admissions into hospital for venereal complaints are less instead of more than in the infantry of the Line; and he certainly did not simplify the problem, when he further showed that there is a permanent standing difference in the rates of mortality of the three Regiments of Guards, which has been rather increasing than decreasing of late years, till the Grenadiers stand at 21·05 per 1000, the Coldstream at 18·20, and the Scots Fusileers at 15·66 —a difference which, as their barracks, their clothing, and their duty are identical, can hardly be attributed to minute differences in discipline alone, though the latter regiment, we have heard it said, claim a certain superiority in point of conduct. More is probably owing to greater strictness in the original selection of the men, or to a recruiting connexion with hardier races of some of our healthy districts.

These are questions of great interest, and can only be solved by a careful comparison of the drill, punishments, hospital treatment, conduct, and habits of the three regiments; and we trust that the officers of the Guards, whether combatant or medical, will not lose sight of them.

The result, however, of these discussions certainly was not to shake the credit nor to invalidate the conclusions of the Royal Commission, for in the course of them not only did the Secretary of State for War give his general adhesion to them, and pledge the Government to their adoption, but the House of Commons, after a protracted discussion, with a general and rare consent, passed a series of Resolutions, at the instance of Lord Ebrington, pledging the House to carry the recommendations of the Commission into effect. So far, so good.

Since that time, however, an opponent more formidable than the Guards' officers has arisen to question, not the data on which the Commissioners have argued nor the facts which they have exposed, but the deductions they have drawn from them, and consequently the remedies which they have advised. Mr. Neison, the eminent actuary (in an elaborate paper read before the British Association at Leeds), challenges the medical opinions hazarded by the Commissioners. He denies that a vitiated atmosphere can be the cause of pulmonary disease. He shows which towns are the most and which are the less overcrowded, and that diseases of the zymotic class vary, increase, or diminish accordingly, but that these differences in crowding have no perceptible influence on consumption at all.

The logical consequence of Mr. Neison's argument seems to

be, either that soldiers are not overcrowded, inasmuch as they die of pulmonary more than by zymotic disease, or that they are overcrowded, but that the disease of which they die is not pulmonary; that the diagnosis of the medical officers is defective; and that a hectic complexion, pain in the side, cough, wasting, and expectoration are symptoms, not of consumption, but of cholera or typhus, which would be absurd. We therefore assume that the first is Mr. Neison's meaning, and if he be right, it will follow from it that the soldier does not require additional space; that the sanitary condition of the barracks is on the whole good, and that any attempt at improvement would be no more than a wanton, because unnecessary, expenditure of money.

These consequences are so serious, and the prospect they offer so inviting, especially when held out by so high an authority, that it will be well to examine the arguments by which the theory is supported.

This controversy seems to have arisen, as half the controversies in the world do, from the inaccurate use of terms. Mr. Neison says that overcrowding, *per se*, does not generate consumption, in which assertion we cordially concur; and he goes on to say what overcrowding, *per se*, does produce, and he tells us it produces fevers and bowel complaints, and the whole class of zymotic diseases. This we utterly deny. Overcrowding does not generate disease at all. It is the presence or absence of a sufficient supply of air for the consumption of each person in a room which affects the health. It is not on the size of the room, but on the size of the apertures into the room, that life depends. Dr. Bence Jones, in his report on the method of determining what number of persons ought to be accommodated in a given space, addressed to the Poor-Law Board in 1856, says:—

"If a single man constantly inhabits the largest room, he will, if it be perfectly closed, be poisoned in it just as certainly as in the smallest room, the difference will only be in the time required; and whether in the small room or in the large room, to live healthily he would require only the same amount of ventilation. The rate of passage of the air (depending on the size of the openings, and the difference of temperature within and without the room), is the important question; for the cubic contents which are enough or too much when one amount of ventilation exists are quite insufficient when the ventilation is less; that is, when the expired air is not sufficiently removed."

And he illustrates this position very happily by the example of a fish confined under water in a glass tube open at the two ends:—

"The time during which the fish would live in the tube would not depend on the cubic contents of the tube, but on the quantity of water caused to pass through the openings; so the cubic contents of a room will give no more information than the cubic contents of the glass tube."

Men may therefore be thoroughly well supplied with air in a very small space, and very ill in a large one. A man in a diving-helmet has the smallest conceivable amount of cubic space—merely a few inches—round his face, but a pump at the other end of a tube is filling his lungs with fresh air all the while; on the other hand, many a wealthy but ignorant invalid is being gradually poisoned in a vast apartment, which the most accurate joiner's work, aided by paste and tow, has made as impervious to fresh air as the coffin to which it is sending him.

The truth is, there can be no fixed rule as to cubic space, unless you combine with it a fixed amount of ventilation per head.

But that a certain cubic space is indispensable to comfort in every room thoroughly ventilated on any plan yet known, is so evident that it may be assumed to be an invariable rule. A few words will explain this.

There is very great difference of opinion as to the amount of fresh air which should be supplied per minute to each inhabitant of a room, to keep him in health. Carbonic acid is a poison, and it is expired from the lungs; but it is by no means established that it is the only poison so expired, but being both detectable and appreciable without difficulty, it may be used as a rough index to the quantity of foul air which should be removed from and the quantity of fresh air which should be supplied to a room inhabited by any given number of persons. The foul air must be so expelled, and the remainder so diluted, that the whole atmosphere of the room shall contain a per centage of carbonic acid so small as to be innocuous. How much this should be is a matter of dispute. Dr. Arnott thinks that one part of carbonic acid in three or even four hundred is injurious, and therefore that a supply of three or four cubic feet per minute, which is calculated to effect that per centage, is insufficient. Dr. Reid recommends ten cubic feet per minute, which would reduce the carbonic acid to one thousandth part. These estimates are all given by Dr. Bence Jones. In the prisons Colonel Jebb gives to each prisoner a supply of 1800 cubic feet per hour, or 30 cubic feet per minute, which, in a cell of 900 cubic contents, would give an entire change of atmosphere every half hour.

Now, the great difference in these estimates, all formed by competent and skilful men, shows how rough they are, and how little is yet positively ascertained on the subject. But if there be difference of opinion as to the quantity of air which should be sdmitted, still greater is the difference of opinion as to *how* it shall be admitted. Extraction of air by single shafts, by double ahafts, by shafts with furnaces, by shafts without furnaces—impulsion of air by fans, through hollow beams, through openings below, openings above, openings from under the floor, openings over the windows—ventilation which acts by the opening of

windows—ventilation which will not act unless every window is kept closed—each of these systems has an inventor, a prospectus, and certificates without end, from learned and unlearned men, testifying to their complete success in unnumbered instances. Each decries his co-inventor, and maintains that his own is the one and only infallible nostrum. In truth they are all good, for they all succeed in bringing in pure air and letting out the foul; and they are all unobjectionable, so long as they are applied in moderation and in rooms not too densely inhabited, and when, consequently, the amount of air to be brought in for the consumption of the inmates, bears a small proportion to the whole amount of atmosphere in the room: or, where the room is inhabited but a part of the twenty-four hours, or of the day; or in halls and churches, where the stock of pure air at the beginning is so large that it nearly lasts out the audience or the congregation temporarily contained in them. But when you have, as in a barrack-room, a large number of adult men inhabiting it both day and night, so that the process of vitiation is constantly going on, and the whole mass of air is hardly ever thoroughly replaced, then it is clear that the amount of air to be constantly brought in is so great that it will cause most sensible disturbance in the atmosphere of the room, and the more you reduce the room while you maintain the stream of air into it, the more intolerable will be the hurricane in which you will compel the inmates to live. The man in the diving helmet has fresh air and plenty; but even though the whole of his body, except the head, is protected from draughts, such a mode of respiration would be intolerable for a continuance. Clearly, you may effectually ventilate any barrack-room, but the men will stop up every one of your apertures rather than be blown out of their beds; and, if they cannot succeed, will troop to the pot house so long as you convert their own room into a Temple of the Winds. It is common to see in barrack-rooms an open grating in the external wall, two feet from the ground, and eight or ten inches from the bed of the man nearest the wall, and in the grating an old jacket tightly stuffed, rather than let the supply of air destined for twenty men be blown through a funnel, in a concentrated form, into the loins of one man as he lies asleep in his bed. The difficulty is, how to diffuse the air so as to render its admission insensible—how to admit the greatest quantity with the least disturbance. It is obvious that this difficulty increases or diminishes as the requisite supply of air is increased or diminished, and that must depend on the proportion borne by the number of men to the area of the room to be supplied, or, in other words, on cubic space. The Commissioners therefore asked for increased cubic space, not because cubic space will in itself give the soldier more air, but because it will enable them by other means to give him an increased supply of air with a greater

certainty of comfort. They laid down an arbitrary minimum of 600 cubic feet per man, which Dr. Guy quarrels with as too low, but they have not attempted to make a Procrustean rule even of that; for we hear that the barrack commission, acting in the spirit of the recommendations of the Royal Commissioners, vary the amount under different circumstances; not, for example, requiring so large an amount in wooden huts, where the whole building is pervious to the air, as in masonry constructions, in which there is no admission of air except through openings made for the purpose; nor, again, do they require the same space per man in high airy situations as in barracks surrounded by buildings, or where from any other cause there is stagnation in the external atmosphere.

It is clear, therefore, that cubic space is only important in connexion with the more or less ventilation by which it is accompanied; but that when ventilation as a rule is deficient, the amount of cubic space hastens or retards the injurious results from such deficiency.

But there is another point, for the elucidation of which an accurate use of terms is necessary. What is overcrowding? Are density of population on a given area, and density of population in a room of given dimensions, the same thing? Is a town area, that is, an area covered by houses, the same thing as a municipal or political area, conjoined within the limits, say of a parliamentary borough? These questions are suggested by the paper read by Mr. Neison at Leeds, in which the same term is used to cover all these different conditions. A comparison is made between the density of population in different municipal boroughs; but the limits of the one may comprise nothing but streets and alleys, while the other may include gardens, market gardens, accommodation land, villas, and parks. The division of a population of a parliamentary or municipal borough by its acreage proves nothing as to its density.

Clearly, any argument founded on the indiscriminate application of the same terms to conditions so essentially distinct as these, must be hopelessly bewildering. Especially is this the case when comparing the condition of the soldier with that of the civilian inhabitant of a town. There is never, or scarcely ever, any area density of population in a barrack, inasmuch as its limits comprise parade-ground, stables, chapel, reading-room, officers' quarters, racket-courts, in short, great area space compared with that on which the dwellings of mechanics and labourers are built. No one has complained of density of population within barrack-walls; it is density of population in barrack-rooms which it is maintained has injured the health of the soldier.

No rational man, however, will deny that over-crowding an area is frequently followed by over-crowding in rooms, and that the

latter, aided by the evils likely to accompany it, will produce a state of health peculiarly susceptible to attacks of fever, diarrhœa, and cholera. All authorities seem to agree on this point, and Mr. Neison, in his Leeds paper, has yielded his assent to it. He has had experience of it. Dr. Guy quotes the case of Church-lane, a part of the old rookery in St. Giles's, which he inspected in company with Mr. Neison, and where the cubic space without ventilation ranged from ninety-three down to fifty-two cubic feet. It was a perfect fever factory, one house alone contributed twenty-two cases of sickness and fourteen of fever. "Yes," Mr. Neison would at once answer—"fever—that is my case; over-crowding produces fever, cholera, and zymotic diseases generally, but not consumption." Now it may fairly be assumed that this wretched population were not suffering from want of ventilation alone. Such neighbourhoods are not remarkable for decency or comfort. The worst fever, the most filthy habits, dirt on the person, dirt in the houses, open gutters, unemptied cesspools, were no doubt all present to contribute their share to the sickness and mortality. Now of all these causes which combined to kill the inhabitants of Church-lane, the first is the only one from which the soldier, comparatively with such a population as that in Church-lane, can be said to suffer, and that in a far lesser degree. The cases in which they suffer from sewerage and cess-pools in the barracks are, comparatively speaking, rare, though it is bad enough that they should suffer from such causes at all. Still they do suffer from them, and when they do, as has happened lately at Gosport, at Croydon, and at Canterbury, fever breaks out among them. But in all these comparisons of the effects of different diseases, it is necessary to take into account the *modus operandi* of each disease. Allowance must be made for the more or less rapidity with which each variety of disease acts on the human frame. Take, for example, the case of drinking. The effects of habitual indulgence in the use of spirituous liquors affect the nervous system and digestive organs; sots die of liver complaint. In his evidence before the Royal Commission, Mr. Neison shows how great are the ravages made by this disease among classes and in countries addicted to intemperance, and he argues from that fact and from the comparative scarcity of liver disease in the army, that the men do not drink. But soldiers do drink. We need not go to the defaulters' book to know that. Every man has ocular demonstration of it in the streets. This mode of argument, indeed, presupposes that men who drink are specially guaranteed against all other diseases except the one which is the legitimate consequence of this peculiar vice: that an immunity against fever and consumption is accorded to them, in order that poetical justice may be satisfied, and that they may die as drunkards should do, by the drunkard's disease. But clearly, it would not

be more absurd to argue that all men who die by disease of the digestive organs have been drunkards, than to say that all drunkards die by failure of the digestive organs. Other and more rapid causes may intervene. A man who is shot does not die of liver complaint, though he may have been an habitual sot, and typhus or cholera are sometimes little less rapid in their effects upon a frame already debilitated by intemperance. The characters, however, of men so dying would, on Mr. Neison's theory, be relieved from the stigma of intemperance, because they had been cut off by the action of a disease more rapid than the appropriate liver complaint. For liver diseases, fatal as they are, are not rapid; the victims of intemperance die off at forty, forty-five, or even fifty, but these, be it remembered, are not soldiers' ages. There are very few soldiers of forty years of age, and those are certainly not the worst conducted. Those who are discharged, invalided, pensioned, or not pensioned, may or may not die of disease of the digestive organs. It is very likely that they do, but we have as yet no evidence on the matter one way or another. We know what soldiers in the ranks die of. They die young, and they die of diseases far more rapid in their execution than those which affect the nervous system and the digestive organs.

Surely it is not unreasonable to suppose that as, under circumstances favourable to their development, typhus and cholera will anticipate consumption, so consumption, under circumstances favourable to its development, will anticipate the diseases of the nervous and digestive organs. Popular terms are not bad indices of the peculiarities which they describe. We hear sometimes of galloping consumption, but never of galloping liver disease.

But what are the circumstances incidental to the soldier's life in England which favour the development of consumption? Mr. Neison says want of healthy exercise, and so say the Royal Commissioners, who appear to have been struck by the amount of deficiency in that respect from which the soldier suffers. But Mr. Neison says it is that alone, whereas the Commissioners say it is that in combination with other causes, some of them even more important. In his evidence Mr. Neison seems inclined to lay down that a man's health depends on what he does, and is not affected by the where or the how he lives. External circumstances, except as regards drink, are nothing, muscular exercise everything; and we look upon his Leeds paper as a great advance, on his part, towards sound doctrine, inasmuch as he there admits the danger to health of external circumstances, such as the impurity of air, the deficiency of water-supply, the absence of sewerage, &c.

But that the habitual admission of vitiated air will injure the lungs and produce pulmonary disease, just as the admission into the stomach of poisoned food will destroy that organ, seems so obvious, that but for its being questioned by so acute a statist

it would hardly be justifiable to detain the reader by adducing evidence to support the proposition. Evidence certainly is not wanting. Dr. Neil Arnott, before the Health of Towns Commission, tells an instructive story about certain monkeys in the Zoological Gardens for whom

"A house," he says, "was built to insure to those natives of a warmer climate all attainable comfort and safety. 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. 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, being 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.

"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."

Now the disease of which these animals died was consumption. They died of inhaling a vitiated atmosphere. They had no symptoms of typhus, nor diarrhœa, nor cholera, nor of any zymotic disease in any form or degree, and they were overcrowded, that is, overcrowded in the sense of the Commissioners and not in that of Mr. Neison. They were confined in a room in which the supply of air was insufficient for the number of the inhabitants who were to consume it, though there was not too great density of population in the area; on the contrary, the Zoological Gardens constitute an ample space, which divided by the number of men, birds, and beasts quartered upon it, would give far larger cubic contents to each individual than the Commissioners ask for the soldier. According to Mr. Neison's test they were not overcrowded, and ought not to have died at all; or if overcrowded, they ought to have died of zymotic disease. The fact is, that they were overcrowded, in comparison with their ventilation—they did die, and what is more, they died of consumption.

Dr. Guy gives another instance of the effects of vitiated air in producing consumption, which appears by anticipation to have completely answered Mr. Neison's theory. He says:

"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. I measured the area of the several rooms and calculated the cubic space to each inmate; 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. 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."

We think we have now said enough to show wherein the fallacy of Mr. Neison's ingenious paper lies. He imagines that the Commissioners in their report had asserted, that too dense a population on a given area produces consumption; this they never did assert; and he proceeds to demolish an untenable theory, which nobody had advanced, by setting up another which is equally untenable, having unfortunately confounded two separate conditions, either of which, if taken to include the adjuncts by which they are generally accompanied, are injurious to the human frame, but neither of which can be said to produce one class of disease alone as their result.

One word more on the general topic of overcrowding and ventilation, and we have done with that part of the subject.

It is often objected, how can overcrowding or non-ventilation be so deleterious to soldiers, when the Dorsetshire labourer with his two bed-rooms and his large family are among the healthiest of all classes. If the fact be so, we answer, that if he breathes a vitiated atmosphere for the eight hours that he is in bed it is for that time only: for twelve hours he is breathing the purest and freshest air possible. On his downs, when he is hoeing or ploughing, he has ventilation without stint in a cubic space which is illimitable, and he breathes this air while taking strong and most varied exercise. In his cottage too, his kitchen, which serves for parlour and all, opens directly on the external air, of

which the exit and entrance of every child or neighbour gives him a fresh supply. Neither is any part of his house probably so air-tight as the barrack built by the Royal Engineers, who pique themselves on the solidity, whatever may be the beauty or the convenience of their constructions. But there is great reason to doubt the fact. It is true that the close packing and indecency of the labourer's cottage has been such as to excite the reprobation of those most practically acquainted with the result. If it be no worse than that of the soldier's, the case of the Government authorities who have tolerated such a state of things in their establishments, does not seem to be much improved by the fact that the comparison is possible. Certainly on the score of indecency, the practice of married couples pigging in the same barrack-room with the unmarried soldiers, equals anything to be found in a cottage. But so far as ventilation is concerned, that comparison by numbers and cubic space is not a fair one. A man and his wife and three children cannot be counted against the same number of adult soldiers. On this point we recur again to the authority of Dr. Bence Jones, who says :—

"For women and children the amount of air required is different. If M. Andral's experiments are true, an adult man burns about ten grammes of carbon per hour, a boy of eight years burns about five, an adult woman, whilst regular, burns from six to seven, a girl of fifteen years six, and an adult woman, after change of life, eight and a half.

"That is, two children of eight years are equivalent to an adult man, and a girl of fifteen is equivalent to a woman. Two women, up to the change of life, are rather more than equivalent to a man. After this time a woman is nearly equivalent to a man. Probably three children of four years would be equivalent to an adult."

This at once disposes of the comparison of the man, wife, and three children, with the five adult soldiers. Their value as consumers of air would probably little exceed half that of the five adult males, and the inconvenience, the danger, and the injury to health must be halved likewise.

So much for the subject of space and ventilation in barracks. It has taken up more pages than it ought within the limits of an article, for of all the points raised and discussed in the Report of the Royal Commission, it is the one which can best take care of itself. It was the most intelligible, and the remedies the most obvious, and therefore it has been the one most taken up by the public; but for all that, it is not the most important. The controversy which has arisen, and the prevalence of some popular errors on the subject, have alone induced us to enter so fully into it.

Our main object is to take stock of our progress in these proposed reforms, and to ascertain to what extent the recommendations of the Royal Commission have been, or are in a fair way to

be, practically carried into effect. Two Secretaries of State have expressed their approval of those recommendations. This, however, *per se*, would not necessarily inspire an unhesitating confidence in the result. But the Commissioners themselves, to do them justice, do not seem inclined to let go the subject. General Peel informed the House of Commons that the President of the Royal Commission had offered, by means of four or five sub-commissions or committees, to elaborate the details, and put the chief recommendations into a working shape, ready for immediate adoption. This proposal he accepted; and the sub-commissions, composed of some members of the original Commission, namely, the late and present Directors-General, Sir James Clark and Dr. Sutherland, with the addition of the Quartermaster-General, Captain Galton, R.E.; Mr. Croomes, late Chief Clerk of the War Office; Sir Alexander Tulloch, Dr. Burrell, and Dr. Farr, were forthwith appointed to various sub-commissions, Mr. Sidney Herbert acting as chairman of each. To one was entrusted the inspection of each barrack at home, and the suggestion of the necessary sanitary improvements in each; to another, the drawing up of a complete code of regulations for the Army Medical Department, for the sanitary as well as medical treatment of the army in the field or in quarters, and for the organization of general and regimental hospitals. To a third, the drawing up of a complete system of statistical forms for the army. A fourth undertook to draw up the regulations under which candidates should be admitted to the Army Medical Department, and to place on an efficient footing the Medical School, which has hitherto languished in a state of inutility at Chatham. A fifth was to define the duties, and to devise a scheme for the transaction of business for the council by whom it is proposed that the directors-general shall be assisted. And, lastly, a draft warrant, fixing the pay, retirement, rank, promotion, and status of the army medical officers, was to be prepared for the consideration of the Secretary of State.

It is understood that all these sub-commissions have reported, but the results have, as yet, in one case only been promulgated. The new warrant for the Army Medical Department has been published. It improves financially the position of the medical officers, it simplifies and diminishes the number of ranks, it lays down intelligible rules by which promotion is to be regulated, seniority being the rule in the first promotion, when the value of the men has hardly yet been tested, and selection for the upper ranks, when the comparative merit of the different officers has been shown by their services. Lastly, without materially altering the rank which each grade of medical officers should hold relatively with the combatant officers, it makes that rank carry with it the substantial advantages which had been previously

withheld. This warrant is a kind of charter to the Army Medical Department. It defines their rights and privileges as well as their material advantages. Their pay was unjustifiably low, looked at merely as a naked matter of salary for work done, and accordingly it repelled the better class of students from a branch of their profession which afforded so low a remuneration. But its indirect effects were worse, for in this country, where money is not overlooked as an element in the attraction of social respect, the rate of salary is held to indicate the social position of the recipient. Still more valuable, therefore, are the provisions which define the relative rank of the medical officer. They practically recognise, for the first time, the status which a scientific body, on whose efficiency the efficiency of the army in a great measure depends, ought to hold in the hierarchy of army rank. In a military body no position can be secure without rank, for in it there can be no overwhelming force of opinion to confer socially and by custom what authority withholds.

Again, the new warrant, by fixing the rules according to which promotion is to be awarded, removes an objection which has hitherto deterred medical students from entering the army service. The warrant embodied the two principles laid down in the following passage of the Report of the Commission :—

"To attract a fair proportion of the best medical pupils to the military service two conditions are necessary—certainty of a competency, and the hope of distinction. Men, who enter a profession after a long and expensive course of study, and who give proof of their proficiency by subjecting themselves to the ordeal of a competitive examination, have a right to expect that, if their professional and personal conduct be unobjectionable, they shall have guaranteed to them the prospect of rising to a rank in the service, which, while assuring to them the means of subsistence, shall give them a certain standing and position in society. On the other hand, the hope of rising, by merit or distinction, to high rank, or to posts which, though unattainable except by a few, confer on those who succeed the highest honours which the profession has to give, operates strongly at the age at which men choose a profession, and when each is sanguine of success in the race in which he is about to engage."

This is clear and sensible, and it was high time that something clear and sensible should be enunciated on the subject. It is necessary to read the evidence before the Commission, not of disappointed juniors, but of officers eminent in their profession, to appreciate the dissatisfaction which prevailed throughout the department on that subject; but in order to understand how just that dissatisfaction was, the late Director-General's evidence should be carefully studied. We have not space to describe the system, even if we understood it. Some faint conception of it may, however, be formed from Dr. Andrew Smith's *naïf* statement, that the

rules have never been written, are known to no one but himself, and are only to be found scattered over a correspondence of forty years; and, again, that it was his practice to make a new rule to meet each special case, but that the rule was never promulgated. In fact, it was a system which combined all the evils of seniority without its certainty, and all the evils of selection without its stimulus.

The warrant has been received with nearly universal approbation; and General Peel and the Horse Guards deserve every credit for the readiness with which they have adopted it.

As regards barracks, the column in the newspapers headed "Military Intelligence," gives daily information of new ventilation, new sewerage, redistribution of numbers, and the introduction of proper cooking apparatus, following the inspections of the Commissioners: and there is every reason to believe that the pledges given last Session, in the course of the debate on Lord Ebrington's resolutions, are being faithfully redeemed.

But what is being done with our military hospitals? We do not mean with the buildings—with the brick and mortar. They, no doubt, will, like the barracks, have their share of whatever improvement their faulty construction is capable of (always, of course, excepting the extravagant blunder which is being persisted in at Netley); but what new organization is to be given them—what is the system to be practised? Are any precautions to be taken to prevent, at the outset of another war, the recurrence of the horrors of Scutari? Are we to have general hospitals at all, and if so, how are they to be organized, and how governed?

There is a great prejudice among army medical officers against general hospitals, and not only among all medical, but among all military officers. We have none during peace, or nearly none. Our system has always been regimental, and the nearest approach to a general hospital is only an aggregate of regimental hospitals. The fact is, that in this, as in many other things, we have for years maintained an army as though it was never to be used. We neither expected nor believed in war; and we failed to give our army in peace the organization which would be necessary for war. On the contrary, we attempted in war to continue the organization, if it could be called an organization, which had insensibly grown up in peace. Thus, in war, we adhered to the regimental hospital system as long as we could, because the records of general hospitals having been records of failure and suffering, the authorities were satisfied that the regimental one was the best (which it may be, provided you have no great number of sick); and, also, because they are used to no other. But a great battle and harassing march, and, what is more common than either, the spread of disease, sooner or later necessitates a recourse to the general hospital system. But the only organization to which every man is accustomed, namely, the

regimental, is inapplicable to the general hospital. They have, therefore, suddenly to devise a system, or to do without one. Great mismanagement, great suffering, great mortality, and moreover, great waste ensue, and every one piously exclaims that general hospitals are great evils; and, therefore, that regimental hospitals are the real thing. They forget that it was the failure of the regimental which forced them to have recourse to the general hospital; and it is the absence of proper system which has converted general hospitals into charnel houses. Great evils they are, because wounds and disease, and their remedies even are great evils. An amputation is a great evil, but that is no reason for submitting the limb to an inexperienced operator, who does not know how to set about it. No one would expect ten companies of infantry, none of whom have ever learned more than company drill, or even attempted to act together, at once to be an efficient regiment; nor will ten regiments, none of whom have ever been brigaded, constitute an effective army; yet we establish a general hospital in this very way, when the necessity arises, and are then surprised that utter confusion is the immediate result.

It is not, however, the want of practice only which produces this result. Whatever system there is, is in itself radically wrong. In war, rapid action is everything. In order to secure it the first conditions are that the machinery should be simple, the number of departments, whose co-operation is necessary, few, their duties and their position relatively to one another clearly defined, their subordination to a common head unmistakeable, and their processes of business simple and rapid.

These objects are not only not attained by the existing system of what are called general hospitals, but the regulations seem to have been framed on purpose to prevent their attainment. It seems to be a realization of Mr. Dickens's "How not to do it." Nothing can be more complicated or more cumbrous than the composition of the staff of the Military General Hospital, and the mode in which the business is conducted. Look first at the organization of a London civil hospital. They could afford to have a complicated system, and a great subdivision of labour, for they are not exposed to the chances nor the roughness of war, nor have they the same necessity for promptness and vigour of action. Yet in a London hospital, then, what are the departments? There is a governor or a committee, who are supreme over all, a steward, a matron, a treasurer, and a medical staff, each with their own distinct duties and responsibilities, but all subordinate to the one head.

Now for the army. It is fair to suppose that Scutari in its later days was more than a fair specimen of military hospital organization. It had been inquired into, and reported upon by commission after commission, and it has been held up as the most perfect

example of what skill and energy (and we must add money) could effect. We have seen that the civil hospital has five departments —one to govern, one to pay, one to supply, one to nurse and keep house, and one to treat—five in all. At Scutari there were eight—the engineer, the paymaster, the commissary, the purveyor, the medical department, the quartermaster-general, the adjutant-general, and the commandant, or general commanding the forces or the garrison in which the hospital is situated. That is to say, one to build and repair, one to pay, two to supply, one to treat, three to govern, and none to nurse—eight in all. At home and in the colonies, there is also the barrack-master, making nine in all, of whom two are to build and repair. Again, the duties of matron are performed by the ward-masters or the hospital-sergeants, the latter of whom being the lowest paid of any, seem to do a good deal of everybody else's business in addition to their own.

But the three who compose the governing power are not in the hospital at all, nor does its management constitute their only or their chief duty. The quartermaster-general and the adjutant-general have an authority over the patients; not, however, as patients who are part of the hospital, but as soldiers who are part of the force. The commandant has a general authority over all, but the hospital is not only not his chief care, but, in point of numbers, it forms a very insignificant part of his command. He can have little opportunity of knowing, and little time to inquire into details, and, in ninety-nine cases out of a hundred, he has neither the taste which would lead him to interfere, nor special aptitude which would justify his interference. To insist on an average general officer in command of a force, whether in war or in peace, conducting the administration of an hospital, is not more absurd than it would be to ask the intelligent governor of the London Hospital, in addition to his hospital duties, to undertake the command of the Household Brigade. Occasionally you may find an officer like Sir Henry Storks, in the later days of Scutari, who has a special aptitude and fondness for administration, and who will set things right when they get wrong; but that was a happy accident, on the recurrence of which we cannot rely, and even if we light on such a man, he cannot anticipate, he can only correct what is known, and the mischief is not known till it is done. In most cases the general officer, conscious of his ignorance, contents himself with an occasional formal inspection, carefully turns a deaf ear to reports of differences and unpleasantnesses, and refuses to meddle till the scandal can no longer be overlooked. In fact, there is no governing power at all, nor are the subordinate departments so placed relatively to one another that they can supply the deficiency. All are equal: all can obstruct, none need assist—because none feel that they must obey. The medical officer can

ask the purveyor for something which he considers necessary for his patients, and the purveyor may procure it, or he may use his discretion and refuse it as too costly, or as not being according to warrant. The building may require alteration or repair, and the barrack-master exercises his discretion whether or not he shall apply to the engineer, who exercises his discretion whether he shall or shall not comply. Each covers his own responsibility by asking. He records his requisition and his conscience is clear. Men under such a system soon learn to acquiesce in refusal, and so save trouble, nor is it to be wondered at, when whatever is done can only be done by a fortuitous concourse of consents. It would require St. Athanasius himself to define these various co-ordinate authorities. But for the entire absence of unity the task would have delighted his heart. In place, however, of unity we have an inevitable antagonism.

And yet the War Office attempts, whether at home or abroad, to regulate and govern hospitals organized with such a machinery as this. These jarring elements are to be reconciled, and the machine made to work by a Secretary of State, through the medium of the Post. There is but one condition on which he can succeed. If he be infallible, omniscient, and omnipresent, the plan is a good one, if he be not it is absurd.

Here is the observation of no inexperienced judge of hospital organization upon this very point:—

"In the military general hospitals," says Miss Nightingale, "as they are now constituted, the governing power is wanting which, by its superior authority, can compel the co-ordinate departments within the hospital to the complete co-operation necessary for success. In the naval hospitals this object is attained, where the hospital is small, by placing the supreme power in the hands of the medical officer, and where it is large, in the hands of a governor, who is generally a naval officer of rank."

This last example seems to be conclusive as to the practicability of the change advocated; for there is an analogy between an army and a naval hospital, which, it may be maintained, does not exist between an army and a civil hospital. As to its efficacy, no one walking through the wards first of a naval and then of an army hospital, could fail to be struck by the superior order, cleanliness, and comfort of the former.

But is this deficiency of a supreme power on the spot, and this unnecessary multiplication of departments, compensated for by rapid and simple methods of transacting business?

Now we have no wish to join the popular cry against the checks imposed to guard the outlay of public money, when the object is to prevent fraud and peculation. Recent commercial revelations lead to the conclusion that, as between too much check and too little, too much is the safest. Character is well worth money

Even if not a sixpence be saved, if every farthing which might have been abstracted from the right channel by roguery is expended on the means of prevention or detection, an immense object is accomplished; but where outlay alone is to be repressed, a balance must be carefully struck between the money saved and the money spent in saving it. If the latter be the larger, there is a clear loss; and even if they are equal, it must be remembered that we have nothing to show in the one case, except two or three clerks the more, whereas the outlay would probably have shown some work accomplished or some end effected, even though neither were indispensable. This seems obvious enough, yet the War Office appears for years to have overlooked it in the management of the military hospitals.

The medical officers formerly had the supervision of the supply to their respective hospitals. The actual details of catering, purchase, &c. &c., naturally fell into the hands of the hospital-sergeants; for it was not to be expected that the medical officer would leave his patients to higgle with the butcher or cheapen the greengrocer. The system was altogether wrong. The wrong person superintended and the wrong person bought. Neither the surgeon nor the sergeant was a fit commissariat. The one was too good and the other not good enough. This system, defective in principle, bore its natural fruits. Allegations were rife, and they were by no means without foundation, that extravagance and peculation prevailed in the supply of the hospitals.

The War Office, not without reason, interfered; but if there was reason in their interference, there was little enough of it in the remedy. Purveyors, or rather deputy-purveyors (for the War Office was honestly determined to do the thing cheaply), were introduced into the military hospitals, and superseded the joint commissariat of the principal medical officer and the hospital-sergeant. The new establishment was full of zeal, and determined to justify its creation by the results it might produce. A great diminution was effected in the hospital accounts; but the purveyors were made, what they ought never to have been, supreme in matters of diet over the medical officer. Too expensive a diet—that is to say, a diet which the purveyor knew cost more than a certain sum—was at his discretion by him refused. It might have been the cheapest diet, if the patient was to be cured or saved by it; but the purveyor judged, not by the effects it would produce on the patient, but by the effect it would produce on his accounts. The medical officers complained, but the purveyors appealed triumphantly to their book and totals; and the War Office was satisfied that the new system was working well. We doubt whether a farthing was saved. We believe the same money was spent, but spent on different things. Patients were stinted, but clerks were fed. The same money was

spent, but some patients were cured more slowly, and some not at all. If the object of a hospital is to save stores, and show cheap accounts, the plan was successful; but if the object of a hospital is to save life, and cure the sick as quickly and as thoroughly as human skill can do it, then the plan was wrong, and, to our belief, expensive into the bargain.

Add to this the disheartening effect on the medical officer, who finds himself thwarted in his efforts to do his duty; who is humiliated by an inferior, comparatively without education, virtually interfering in his treatment, and who is taught the lesson that he need not estimate so very highly the human lives entrusted to his care, since the authorities above him put them in the balance, not against pounds, but against shillings and pence.

When the Russian war broke out, the system was in practice materially modified, and according to the now existing usage, the purveyor obeys the requisition of the medical officer, representing at the same time any apparent extravagance to superior authority; but we doubt whether any regulation exists compelling him so to do.

The late director-general, however, from first to last protested stoutly against the new evils of the new system; but his remedy was either to revert to the old system, and reconvert the medical into a commissariat officer, or to make the purveyor the immediate servant of the medical officer. This arose from the singular conception of the duties of a physician or surgeon which has hitherto existed in the Army Medical Department, and which is certainly peculiar to that branch of the medical profession. It has been held that young men should practise, operate, and prescribe; but that the higher ranks should be confined to what have been considered the higher duties of administration. A very grand name for very humble offices. To the surgeon very properly, to the assistant-surgeon very improperly, have been made over the knife, the pharmacopœia, and the *corpus vile* of the British soldier. To the experienced physician and skilled surgeon — namely, to the inspector or deputy-inspector—have been entrusted the sacred inspection of stores, the cleanliness of wards, the filling up of returns, the countersigning of requisitions, the necessity of which he has less means of judging than the prescribing officer, the supervision of washing, and even of washerwomen; in short, all the dealings with buildings, with furniture, with stores, with pots and pans, which in civil hospitals are the province of a house-steward, a matron, or a housemaid. To such an extent has this been carried, that in the Russian war a medical officer of some standing was actually employed for weeks in tasting wine, and testing the soundness of corks, bottle by bottle, while in the hospitals close by there was an urgent want of medical men to attend the sick and wounded.

Imagine Sir Benjamin Brodie withdrawn from the bed-sides and the theatre at St. George's, and, in virtue of his experience and ability, set to overlook accounts, countersign demands for extras, check the issue of stores, and see that the broom and the scrubbing-brush have been properly applied.

Messrs. Cumming and Maxwell, the commissioners sent in 1856 to inquire into the state of the hospitals in the East, seem not unnaturally to have been struck by the way in which the time of the medical officers was thus encroached upon by these subordinate and almost menial duties; and they remarked upon the apparently large number of medical officers on duty at the very moment that there were loud complaints of their insufficiency. The supply was not deficient, but the distribution and application of the medical staff was such that the public service derived little or no benefit from their presence. Their skill, knowledge, and experience were being systematically wasted. They were doing, at large salaries, what uneducated men would have done better on small ones; and what purely medical duties they did perform, and which consisted in inspecting the practice of those who were actually engaged in treating the patients, was probably on the whole more injurious than advantageous to the service, for it relieved the latter from the responsibility of their treatment—a responsibility which is the only safeguard of the patient, who, on the other hand, had gained but little by the interference of the superior officer, who, if more learned as to the rules of treatment, was of course less acquainted with the details, peculiarities, and previous history of the particular case. The Report of the Royal Commission puts this clearly enough:—

"By this system," they say, "it is true that the juniors are enabled very early to acquire a great amount of experience, but they acquire it, to a great degree, at the expense of the patient—they learn their mistakes by the results. The superintendence of the inspector, who has not observed the case from its commencement, is not of great practical value, especially when the number of cases is very large, and his attention is distracted by the details of the administration of the hospital. A patient treated by an inexperienced junior, and superintended, or rather interfered with, by a pre-occupied senior, is as little likely to gain by the interference of the one as by the original treatment of the other."

The Report then proceeds to point out the effect of this system on the young medical officers themselves:—

"We cannot but think that, in addition to the direct loss to the State by the misapplication, which is the waste, of the valuable time of the seniors, this system has, indirectly, a bad effect on the juniors.

"Every young man looks forward to the ultimate attainment of high rank, and to the performance of the duties which belong to it. He naturally attaches the highest importance to those functions, and

he insensibly learns to undervalue those which seem to belong exclusively to the lower grades, and from the practice of which he hopes, by promotion, to be emancipated. The assistant-surgeon is led, by the present system, to look to the performance of administrative duties as the ultimate object of his ambition, and knows that, when once he can reach an inspectorial rank, it is on their performance, and not on his medical skill, that his reputation and his further chance of advancement will depend. The result must be to lower his estimation of the highest duties of a scientific profession, and diminish his ardour in its pursuit. Neither is it without its ill effect on the senior, who, when retired from the service, does not compete with the civilian practitioner on terms so advantageous as he would have done had not his medical practice been partially suspended, and his skill and science allowed to rust during the years in which he was employed on those administrative duties which occupy so much of the time of the inspectorial ranks."

These remarks are well worth consideration. It was not only the low pay, or the advantages of rank withheld, that lowered the Army Medical Department in the esteem of the medical profession and their own. Employed at the commencement of their career in a manner which their inexperience did not warrant, but at the same time over-inspected, because untrusted, they felt that they were treated like schoolboys, and not like gentlemen; and if, while collecting their hazardous experience, they acquired a strong interest in and love of their profession, that interest and love were repressed by the reflection that the fruits of their experience would never be gathered, but that they would take leave of the higher and more scientific duties of their profession just when they became fit to perform them.

But looking at this system simply as a matter of organization, it is remarkable that, after searching through the whole mass of evidence given before the Commission, not one witness can be found to defend it. Indeed, all the evidence taken on this subject goes the other way. Sir Benjamin Brodie seemed utterly at a loss to understand the practice. He states that—

"his duties at the end of thirty-two years, during which he was surgeon at St. George's, were the same as on the day he began. He is of opinion that everything which a surgeon requires should be found, and everything which he orders should be done, but it should be done to his hand, his time being too valuable to be spent on any duties to which his medical science and experience are not available."

This is the common-sense view of the matter, and so obviously so, that it is useless to expend further argument upon it.

It would be endless to go through, in detail, the various misapplications of men and work of which the distribution of the medical department is a specimen. The ward-master or hospital sergeant is overloaded by the amount and variety of the work imposed on him; and the nursing work, which is his first duty,

is generally sacrificed to the writing work, because the neglect of the latter is at once detectable, and produces official confusion, whereas the former is not detectable out of the hospital, though its consequences within it may be fatal. The nursing therefore falls into the hands of the orderlies, who are soldiers taken from the ranks, who enter knowing nothing of their duties, and who are liable, as soon as they have acquired them, to be recalled to their regiments. To obviate this evil, the medical staff corps was created, who of course at the outset were as ignorant as the orderlies. If continued, they would in time have acquired a knowledge of their duties; but the evidence of an army surgeon employed on the Netley inquiry leads to the conclusion, that the corps is, or is to be, dissolved, for it appears to be contemplated that at Netley the patients are to nurse one another. Here is the account given by an eye-witness of the working of the orderly system at Scutari:—"The orderlies do not bring skilled labour to the work." "The cleaning and airing of the wards (at Scutari) would make a housemaid laugh; each orderly worked at it in his own way, and then the patients undid it all, and it had all to be done over again." "Except when the medicine was given by the medical officers themselves, or by the women, it was taken by the patient or not, at his own discretion."

But without dwelling further on the ill construction of the various departments by which the general hospitals were worked, we will answer the further question as to the simplicity, rapidity, and accuracy of the conduct of business, by the following description of the system of requisitions by which the necessary supplies were in a great measure obtained in the hospitals on the Bosphorus:—"The mode of supply by requisitions is faulty both ways, both in pretending to supply that which is not in store, and in not supplying that which is. For the requisition remains, although the supply has never been given; and the supply is often not given, although it is in store." That is to say, that a requisition which had not been complied with, and which as a document has just the same value as a dishonoured check, was kept as evidence of a transaction which had not taken place, and as a voucher for the issue of what had never been supplied. A comparison of such vouchers with the original store might have led to a belief in the re-enactment of the miracle of the widow's cruse.

Here is a short but simple sketch of the organization which Miss Nightingale's joint experience, both of civil and military hospitals, leads her to recommend both as regards the *personnel* and the *matériel*.

"One executive responsible head, it seems to me, is what is wanted in a general hospital, call him governor, commandant, or what you will, and let it be his sole command.

"The departments should not be many:—

"1. A governor, solely responsible for everything but medical treatment.

"2. A principal medical officer and his staff, relieved of all administrative duties, and strictly professional.

"3. A steward, who should fulfil the duties of purveyor, commissary, and barrack-master, and supply everything, subject to the governor.

"4. A treasurer, who should be banker and paymaster.

"5. A superintendent of hospital attendants, who should undertake the direction of the cooking, washing, care of hospital furniture and government of orderlies. All these officers to be appointed at home by the War Department. According to this plan, the governor would cumulate the functions of quartermaster-general and adjutant-general, and, under the advice of a sanitary officer attached to him for that purpose, would be solely responsible for carrying out the works advised, and for engaging the requisite labour.

"*Supply.* With regard to the mode of supply, let the steward furnish the hospital according to a fixed scale, previously agreed upon.

"With regard to food, let the steward make contracts, subject to the governor's approval, and with power to buy in the market at the contractor's expense if the contractor fails. A scheme of diets should be constructed, according to the most approved authorities, in order to save the cumbrous machinery of extra diet rolls. Equivalents might be laid down, so as to afford the necessary choice, depending on the nature of the climate, the season of the year, the state of the market, the productions of the country," &c.

This sketch, *mutatis mutandis*, and preserving, which is always important, the traditional military names of purveyor and paymaster for the civil terms of steward and treasurer, indicates an organization at once simple and effectual. The scheme recommended by the sub-commission probably does not differ much from it. Improved and enlarged diet tables were, many months ago, prepared by one of the sub-commissions and communicated to and revised by Dr. Christison, the highest living authority on this subject. These revised tables include a great variety of diets; for, it must be recollected, that reversing the ordinary rule in such matters, the greater the number of diets contained in a diet table, the more simple its working is. A short diet table implies a long list of extras, and each extra requires a requisition and a separate transaction for each patient for whom it is ordered; whereas a varied table enables the treating surgeon to prescribe the diet for each patient by a simple reference to the letter or number at the head of the various columns in the table, which comprise, in different combinations, the articles hitherto in general use as extras.

It would take too much time to particularize how much of this proposed organization would be applicable to regimental as well as to general hospitals. Both require to be dealt with on the same principles, and with a view to the attainment of the same

objects, namely, reduction in the number of departments, definition of the duties to be performed by each, and simplification of the forms and processes by which the business is to be carried on.

But the general hospital is the one on which the greatest pains should be bestowed, because it is there that the existing system is the most defective. You cannot do without them in war, and you cannot have them effective in war unless you give them a good organization, simple and suited to the rough exigencies of war, and in which those who are to conduct them have been thoroughly practised during peace.

But as these military general hospitals have to be extemporized in war, as their habitat is often shifting—as they must frequently be established in buildings never intended for the purpose, and in localities requiring minute inspection and much sanitary precaution before they can be adapted to hospital purposes with any security to the sick, it will be necessary to provide the governor, who is to be responsible for the safety and efficiency of the whole, with the best possible advice on points on which obviously he cannot himself be a competent judge. This is the reason why a sanitary adviser should be attached to him as to the quartermaster-general of an army. The duty of an army surgeon is curative, but it is not so much so as it is preventive. Health is the first condition of success to an army, for health means numbers. Precaution alone can arrest the constant thinning of the ranks by disease. Remedy, however effectual, comes too late. For the mere purpose of the campaign, putting aside humanity and duty to the soldier, the success or failure of the remedy is not very material. Indeed death effects an army less than disease. For death only diminishes numbers, whereas disease not only diminishes numbers, but detracts from the efficiency of the remainder who are still unaffected by it. The hospital intercepts rations, transport, guards, surgeons, money, all of which are wanted to maintain, in efficiency, the army at the front. No doubt it was some such calculation as this which led the Emperor Napoleon, that great military utilitarian, to cumulate so much medical and sanitary precaution on his fighting men, and to trouble himself so little with the fate of his sick and wounded. But inhuman as it may be thought, the lesson ought not to be lost upon us. It need not teach us to regard our disabled men less, but it ought to teach us to regard our active battalions more. We have not that constant warlike habit and experience which generates a belief in it. Nor is this scepticism, or rather this ignorance, peculiar to military men. It is the same in civil life. Sanitary science is looked upon as mere humbug by the mass of mankind. It is not till we have been decimated by cholera that we can be persuaded to cleanse our dwellings, to remove our cesspools, and attend to our sewers. Neither is the civil surgeon as much in

advance of the lay civilian on these matters as his education and knowledge should make him. The generality of civil physicians and surgeons live not by prevention but by cure, and what men live by they most esteem. They neither live by prevention, nor practise it, nor do they teach it. Our army surgeons have acquired the groundwork of their medical knowledge in civil schools, but the specialty of sanitary science they have never been taught. They may have picked it up, and though many may thus be ahead of their civilian co-professionals in this respect, there are but few among either the civil or the military who have studied it as a specialty. The combatant military officer, again, like the lay civilian, is seldom practically convinced of the necessity of measures of prevention, and is conscious that he is too ignorant to know whether the advice offered him is sound; and, if convinced of the necessity, perhaps doubts, and often justly doubts, whether his adviser knows much more about the matter than himself. There was no lack of evidence to show the royal commission how often medical advice is not asked, because its necessity is not felt; how often when volunteered it is resented as an intrusion, or, if asked, is not acted upon, because not good, or not thought to be good. The commission seems therefore to have attached great importance to raising the standard of sanitary knowledge among army medical officers, and recommended measures to secure that that knowledge when attained shall be produced, and when produced shall be attended to, or, at any rate, not carelessly or capriciously set aside.

When a medical officer goes to the general-in-command who, under a tropical sun, up a river surrounded with swamps, is feeding his troops on salt pork, and tells him that unless he gives them fresh meat and vegetables they will be down with scurvy and fever, he does no more than his duty, and what it is imperative that he should do. But if he is met by the man in authority with the rejoinder, "Sir, when your advice is wanted it will be asked for," he probably vows never again to expose himself to such a rebuke. Six weeks after he is called upon to cure disease which is not curable at all, or not curable in time, though care and precaution a few weeks earlier might have obviated much of it. Such things ought to be impossible, and the Commissioners urge that so far as regulation can affect it, they shall be made impossible. "The duty and responsibility of both the commanding and the medical officer," say they, "should be defined by regulation. The medical officer should be made to feel that, charged as he is with the care of the troops in health, as well as with their treatment in sickness, he is responsible for any act or omission which his advice or warning might have prevented; and the commanding officer should be made to feel that he is responsible for disregarding that warning or overruling

that advice, and should have sound reasons to show for the course taken." The Commissioners therefore propose to fix on the medical officer, whether in peace or war, the duty and the responsibility of tendering his advice in writing, and on the commanding officer that of adopting or rejecting it. In the latter case the reasons for rejecting it might be perfectly sound on strategical, while the advice itself was equally sound on sanitary grounds; but in this, as in any other case, the reasons for rejection would be endorsed on the document in which the advice was tendered.

By this regulation the proper responsibility would be fixed on each; at present a military disaster is like a railway accident, no one is ever to blame; but when once the man whose business it is to advise is made to record his advice, and the man who is to act record his reasons, we shall know, as the Turkish pacha said, whose beard to pull. It is proposed that this regulation should apply to all medical officers in relation to their immediate military superiors; but it is further and most wisely suggested that to the quartermaster-general of an army in the field, and to the governor of a general hospital, a special sanitary officer should be attached. This is right. The duties to be performed are so important that not only must the very best advice be secured, and it can only be secured by previous special study and preparation, but means must be taken to ensure that the whole attention of the officer appointed shall be concentrated upon his particular work. The principal medical officer in charge of the force cannot do it. He is at the head of a large medical staff in charge of divisions, brigades, and battalions, scattered over a vast extent of country. He has an enormous amount of official business to transact. If there be much sickness the work is overwhelming. If, again, the sanitary duty be entrusted to a medical officer not restricted to sanitary, that is precautionary, duties alone, the progress of disease and the consequent want of surgeons will withdraw him first partly, then wholly, from his specialty, and while engaged in treating the sick, he will, by his neglect of his primary duties, be increasing the numbers who are already overwhelming the hospital. These sanitary officers cannot, therefore, be too exclusively devoted to their special science, nor too rigidly restricted to the one paramount duty of precaution and prevention.

There are several capital errors in the system by which candidates are now admitted to the army medical service. They are called upon to produce certificates and to undergo an examination; but of the certificates required, some do, and some do not, constitute evidence of the study of medicine as well as surgery, and the mode of examination is deficient in these points. The examiners are named by the person who names the candidates.

There is, therefore, no confidence in their independence. Different men are named examiners at different times, the result is that the standard of the examination varies, that as the examiners are not habituated to the work, nor accustomed to deal with pupils, as teachers are, they are, comparatively speaking, inefficient; and, lastly, that the examination is entirely theoretical, both in medicine and surgery, while in that which is the most important of all to the army practitioner—namely, preventive science, which we may call military hygiene, there is no examination at all. Now it is clear that the public will never place confidence in the fairness of an examination when the examining body is dependent on the very authority who exercises the patronage. The examination is the only check on the improper exercise of patronage. True, there have never been any imputations of unfair acceptances or unfair rejections of candidates; but, in what we fear we must call the degraded state of the profession, there has been little or no competition for admittance into it, and the favour was all on the side of the candidate and not of the patron. Let us hope that those times have passed away, and that with higher attractions to the profession will come not only a higher class of candidates, but more of them. The prize will be worth winning, and provision must be made that the race be fairly run. The East India Company set an excellent example in this respect. There is a permanent independent board of examiners for the Indian medical service, composed of men whose names are a guarantee, not only for their rectitude and independence, but for their thorough competence for the performance of a duty which requires constant practice to be done well. A chance deputy-inspector pressed into the Director-General's office to conduct an examination, who had long ago forgotten what he learned in the schools, and lately forgotten (thanks to the administrative system) what he learned in his practice, is the very last man to discern the difference between mere memory and ability, between sound knowledge and a superficial cram. All the evidence goes to show that, unless an examiner be a teacher likewise, and conversant with the habits and attainments of students, he is little likely to prove efficient. Nor is a mere book examination a sufficient test, for much theoretical knowledge may be got up by a young man, who, with the dissecting knife in his hand, or at the bed-side of the patient, would prove to be utterly helpless.

What is required, then, in order to secure efficient candidates and an efficient examination, is, first, to require from all a diploma in surgery, and a licence in medicine, derived from some competent body; or a degree in medicine, the qualifications for which include the knowledge of surgery. The candidates should also produce certificates of having attended courses of practical instruction, such as materia medica and practical pharmacy, practical

chemistry, practical anatomy (in which the student shall have himself dissected the whole body at least once), clinical surgery, ophthalmic surgery, clinical medicine, and attendance on hospital practice of not less than a year. Add to this—if, under the new system, a strong desire to enter the service is manifested—a university bachelor's degree, or its equivalent, as tested by examination. This test has been applied in the examinations for the fellowships of the College of Surgeons with a marked success in raising the tone and character, as well as the attainments, of the candidates. The man who has had the advantage of a liberal and general education will always be immeasurably superior to the man who has got up a stock of medical knowledge and nothing else. The former has learned to learn. He has braced his mind and enlarged his judgment, and there is far less fear of subsequent stagnating when once his object is gained, than in the case of the latter. No means must be neglected by the military authorities through which the weight and influence of the medical officer in his regiment can be raised. His position, socially speaking, is sure, in a country constituted like England, to be considered inferior to that of the combatant officers. The position which he must aim at is an intellectual one. He is a member of a scientific and a liberal profession, and he must show to those with whom he associates that he is master of it.

As "new brooms sweep clean," possibly under the new Medical Council changes and improvements will be effected which will raise the whole standard of medical education, and so long as the military services wisely trust to the civil schools for their education in medicine and surgery, they will reap the full benefit of those improvements, especially if the examination of their candidates be entrusted to an independent board consisting of the first civil examiners and teachers to be got.

That, however, which is the most important of all to the army-surgeon, remains untouched by these proposals, because untaught in the civil schools. The diplomas, the certificates, the examiners, and the examinations we have indicated, will give to the army as good civil practitioners as can be got, but they will give them nothing more. We shall have got a fair prospect of the means of cure, but none of prevention. Military hygiene is not taught in the civil schools. It is not to be expected that it should; but even sanitary science as applicable to civil life forms no part of the teaching of the civil schools, unless the few lectures given at St. Thomas's Hospital be an exception; and this is natural enough. A young man enters a profession for his livelihood; that which gives no remuneration offers no attraction. The surgeon and physician cure not only that their patients may live, but that they may live themselves. No man fees a doctor except for work done. If he is ill, he sends for him. If he is well, he

does not trouble his head about him. The Emperor of China is the only man who has the sense to pay his physician only when he is well, and stop his salary from the day when his illness commences till the day he is convalescent. That is his way, but it is not ours. The aim and object of the medical man, and his hope of living, depend on his curing, not on his anticipating, disease. The schools can only teach what young men must study, and they will only study that which will bring them in a livelihood. They are to live by disease, not by preventing it. The sanitary doctor's specialty is to prevent. That, however, he cannot live by, unless employed and paid by some public body whose interest it is to do so. His functions are of an entirely different character from those of the curative doctor. His practice is not ancillary to that of the curative doctor; nay, it is almost hostile to it, for the prevention of disease does not contribute to the prosperity of medicine and surgery. The sanitary doctor is to the curative doctor very much what the landowner who shoots foxes is to the master of hounds: he spoils his sport. It is vain, therefore, to expect that the civil medical schools should go out of their way to teach what few want to practise, inasmuch as, except from public bodies, there is no remuneration to be expected from it, and it forms no part of, but so far as it is successful, is incompatible with, a large experience of the curative treatment of disease. The army, therefore, which is a public body to whom preventive science is far more important than curative, must of necessity find the means of teaching it themselves, or must allow the medical officers either to practise it without having been taught, or else not to practise it at all; processes the risk of which can unfortunately be exactly measured by past results. The death returns of the Walcheren, the Burmese War, and the Crimea show what are the fruits of such neglect. The latter, especially, offers the most valuable testimony, inasmuch as, to use the words of the Royal Commissioners, it "offers to our view the most complete case on record, on the largest scale, of neglects committed, of consequences incurred, and of remedies applied."

The Government, therefore, must find some means of teaching that which is not taught in the civil schools, and never will be, and which is far more important to the army than what is taught in the civil schools, and fortunately there lies ready to their hand an instrument well adapted for the purpose. There languishes at the great army hospitals at Chatham, an institution having the semblance—but the semblance only—of a military medical school. The candidates who have passed the ordeal of the examination in the Director-General's office, are sent down to Chatham to the Invalid Depôt and Fort Pitt, and the General Hospital at Brompton, and there study medicine and surgery, and receive pathological instruction. In fact, they are taught that which an examination

is supposed to have just ascertained that they already know. The practice seems to have arisen from a kind of misgiving that the previous examination was not worth much, and that the intervening course at Chatham would act as a safeguard against an utterly incompetent practitioner being appointed to a regiment. But even in this it failed; for there is no fixed period during which the candidate is to remain at Chatham, but he stays one week or fifty-two weeks, according as vacancies for assistant-surgeons are few or many. Now if the examination was such as to secure in all cases a thoroughly competent general practitioner from the civil schools (and a soldier's leg is amputated in the same way as a civilian's, and their fever or cholera must be treated alike), the interval between the successful examination and the actual appointment to a regiment offers the time and the opportunity to convert the civilian into a military practitioner. That is the time, now that he has left the civil schools, to instruct him in the treatment of tropical diseases, and all the diseases to which the soldier is peculiarly liable; to make him acquainted with the habits, not only of soldiers but of armies; to show him the dangers to which they are peculiarly exposed, and the best means of defence against them; to impress upon him the importance of vigilant precaution; to imbue him with the science of sanitary prevention, and to store his mind with resources drawn from the great precedents of the history of armies, whether in quarters or in the field.

Fortunately, therefore, there is no Government institution to create in this case. The institution is there; and indeed it is one of those cases in which Government has no option. It is no question whether a government or "private enterprise" can do it best. "Private enterprise" cannot do it at all. Government must do it, or it wont be done; and if it be not done, we know the consequences.

Chatham is peculiarly adapted to a school of this description. No hospitals in England present so great a variety of cases. It is a great depôt of recruits and a great depôt of invalids. The latter, returning from all parts of the globe, offer opportunities of study of the sequelæ of the peculiar diseases contracted in a soldier's life. The recruit shows the type of the material which these diseases threaten, and from which it is to be the business of the surgeon to defend him.

There is a large medical staff for the treatment of these hospitals. Convert some three or four of them into professors, or rather, select for the principal medical officers in these hospitals men capable of instructing as well as treating; make every candidate, whatever be the exigencies of the service, pass through a stated definite course, tested by examination, before he is judged capable of taking up an appointment, and you have at once a

school which will not only bring the juniors into the service, with a standard of attainment and preparation never yet seen, but which will, by holding out these professorships as prizes to the seniors, offer an inducement to scientific observation and study, and to that accuracy of knowledge which teaching so indispensably requires, and which must ere long elevate the character of the whole profession.

Not many professors would be required. Military hygiene, clinical military medicine and surgery, pathology, and natural history and applied chemistry, would be the subjects of instruction. The two latter need not require a professor. The curator of the museum would teach pathology and natural history, and a good practical chemist (an officer without whom the hospitals are not efficient) would give instruction in applied chemistry. But of all these subjects, military hygiene should be first and foremost. That is the most important to practise and the most difficult to teach. "It is sanitary science," say the Royal Commissioners, "applied to the prevention of disease and mortality, under conditions far more varied, more threatening to health, and above all, more sudden and novel in their character, than those which affect the health of men engaged in the ordinary avocations of life."

To be an effective teacher of military hygiene will require no ordinary attainments and no common grasp of mind. The lecturer must possess a thorough knowledge of the physiological laws relating to health, of the physical geography and the medical topography of the greater part of the world. He must know the character of every climate and every soil, their changes and peculiarities, the dangers arising from them at various seasons and under different conditions, and the best available safeguards against them. In towns, as in the country, he must be prepared against the emanations which produce typhus, plague, and their kindred diseases, as well as against the marsh miasmas, with their train of remittent and intermittent disease. Space, ventilation, cleanliness, personal and local, diet as applicable to climate, with the nutritive value and the wholesomeness of different equivalents under different circumstances, must all have been studied by him. He must be conversant with the habits of armies in the field, and must be able to point out the precautions necessary for the selection of sites for camps, for huts, even for bivouacs: how best tents, huts, barracks can be drained, ventilated, and warmed; how hospitals should be placed, and how constructed, for health and administration. He must know well the history of disease and mortality, not only in our own, but in foreign armies; in short, he must be physician, physiologist, geologist, meteorologist, topographist, chemist, engineer, and mechanic; and he must be all these things not as a theorist, but as one prepared to make

practical application of these sciences to the varying exigencies of military life, and to teach others to do the same. Where is the man? He must, however, and will be found, and no surgeon must be allowed to practise in the army till he has passed through his hands.

No branch of a profession, however, thrives which has not a head. Knowledge which is confined to the lower ranks dies with them. Labours which are performed unobserved and unchecked by a competent as well as watchful superior authority, cease to be performed with zeal, till they cease to be performed at all. The sanitary duties of the army medical officer must, if well performed, be rewarded, and be rewarded by distinction and promotion equally with the curative. Sanitary science as well as curative science must be represented at head-quarters.

There would be a direct economy in establishing in the office of the Director-General a sanitary branch, with a competent officer at its head, specially devoted to the overlooking and directing all sanitary measures. We have thrown away not hundreds of thousands, but millions, in the course of the last ten years, from our blind and reckless neglect of the simplest laws in this respect. A man who had seen the modern hospitals at Paris, such as Lariboisière and Vincennes, would have been struck by the wonderful simplicity of the plans, and by the light, the airiness, the cheerfulness of the wards; and that in a climate far more severe than ours. But we had no sanitary department in the office of the Director-General to look to these things, and no one whose business it was to study the construction of buildings for the use of the sick, nor the conditions necessary to a healthy site. Hence, when an immense sum was voted to create a general hospital; with all England to choose from, our selection fell on three acres of clay, standing over ten miles of mud bank, with a soft, damp climate, in a district to which there is no record of any man having been ever sent for his health by any physician that ever lived; and this is to be a place of recovery for our soldiers returning from abroad, the majority of whom come from tropical climates, and whose constitutions, according to the highest living authority, Dr. Martin, require a high, dry, bracing climate! A plan was adopted, magnificent in scale, far more extensive than is likely to be required, and far more costly than was necessary, and which, with reduction, was admirably adapted for a barrack, though quite unsuitable to a hospital. Not but that Netley is a step in advance. To get a good barrack instead of a hospital, is an advantage which the sick soldier is not everywhere provided with. In the majority of our stations, the best hospitals are those which were built, not for hospitals, but for barracks. Where a hospital was designed as such, the constructor seems to have racked his ingenuity to devise as many crooked corners, blank

walls, dark and unventilated spaces as possible; as though light and air, instead of being the two first requisites of a hospital, were dangers to be carefully guarded against. At Woolwich—not in the benighted days of the Georges, nor even of King William, but in the reign of Queen Victoria, in this very decade, during the Russian war—a ward was added to the General Hospital, which we venture to say is the largest room with the smallest window-space which can be found in all England, built to be inhabited by human beings.

At Dumdum, within a drive from Calcutta, upwards of 500 women and children perish from disease, in fifteen months, out of a mean strength of about 1000, from sheer overcrowding in unventilated rooms. It seems as though we wanted to rescue the memory of Shah Soujah and the Black-hole from infamy, by showing how, by our ignorance or neglect, or both, we can emulate his world-known crime. For it is ignorance and it is neglect; and it is horrible to find that so little is the responsibility of the authorities felt in this respect, that the Government is actually praised for its energy, because one of its officers, as soon as the details of the tragedy were known (that is, when the victims had been dying for weeks), drove over in a buggy, and made a report. As if a report would resuscitate the dead, or save the living! How came the details not to be known? And who was the military, and who the medical officer, who ordered or who allowed the crowding which destroyed these poor creatures?

These things would not be possible if the army medical officers were made to understand that their first great duty is prevention. But for this purpose their responsibility must be fixed, and they must have secured to them the means of acquiring a really sound sanitary as well as curative education, so as to make them equal to their responsibility.

Lastly, there must be, in the office of the Director-General, a department, with a recognised, competent head, to overlook, to advise, and, above all, to be responsible for the advice given on these subjects. At present, the Director-General has no responsible adviser. Medical officers, who happen to be near at hand, are seized upon and constituted advisers, *pro hâc vice*, not because they are competent, but because they are near at hand. Chance makes them advisers, and chance is to blame, not they, if the advice they give turns out to be bad. If they are right they get no credit for it, and it is but fair that if they are wrong they should escape blame. This was the composition of the office under the late Director-General, and it is so still. The work is multifarious, and in extent and variety far beyond the powers of any one man. There is a vast routine business to transact with the 700 or 800 medical officers over whom he is the sole professional authority. He must have that

undefinable tact in governing men which induces them to follow willingly, and acquiesce in his decisions even when against them. He must be gifted with discernment, to judge of merit and capacity, not only for the purpose of awarding promotion with justice, but of allotting to each the task for which his attainments or qualities especially fit him. He is ultimately responsible for the health of an army of 150,000, or 180,000 men, scattered over the world, in every latitude, and in every climate. He has to deal with sanitary questions, on the largest scale and in the greatest possible variety. He has to deal with medical questions, with surgical questions, with statistical questions. He must be able to interpret rapidly the dry array of figures before him, and argue from them to sound conclusions; to trace the evils detected to their true causes, and to apply the proper remedies. To do all this, he is to be assisted by a few clerks, and his judgment is to be strengthened and informed by whatever medical officers, of a certain rank, happen to be at home on leave, or to be quartered within reach. We mean no disparagement to the talents of the late Director-General, who was an able and scientific man, when we say that the task was altogether beyond his strength. We mean none to his successor, when we say that if he attempts to discharge his duties, with an office constituted like that of his predecessor, he will utterly fail. It is an impossible task. A simple recurrence to the old form of an ordinary board will not meet the difficulty. A board, consisting of members having equal powers, voting on each measure as it arises, is a form of government almost incompatible with a decided and energetic administration. It divides the power without strengthening it. It either produces continual difference and continual bickering; or it results in a series of compromises, in which every convenience except the public convenience is consulted. Little is done, and for that little the responsibility is divided. When representation is an object, these evils have to be endured, in consideration of the advantages by which they are compensated; but where administration alone is the object—where rapid but not hasty decision, energetic but well-considered action are required, the responsibility and the decision must be vested in one man, but the mind of that one man must be strengthened by friction with the minds of men whose special acquaintance with each of the classes of subjects on which he has to decide, make them competent to inform him. They should be responsible for the advice they give; but he, and he alone, should be responsible to the Government and to the public for the decision taken.

It is scarcely necessary to remind our readers that these are the principles on which, after long discussion, and with almost universal consent, the greatest administrative office in the world has been constituted—namely, that of the Secretary of State for

India, with his council. A director-general solely responsible, but assisted by three councillors—one medical, one sanitary, and one statistical—through whom all business would pass which might appertain to the specialty of each before it came up to him for decision, all important measures being reserved for discussion by all, but for the ultimate decision of one, appears to us to constitute a machinery the most likely to perform the duties which have hitherto proved too much either for an unaided autocrat or an irresponsible board.

Lastly, let us reprint from the Report of the Royal Commission the following sentences:—

"Without some publicity we fear that this subject may again fall into oblivion and neglect, and the evils which we have described continue unnoticed and unremedied.

"The publication of the statistics of mortality of the troops in the West Indies enabled the Secretary at War (Lord Howick) to grapple with the evil and apply a remedy.

"It is desirable to ensure to the troops at home the advantage of the same publicity, in order to secure the adoption of the measures necessary to relieve them from the continued influence of conditions deleterious to health and life."

We have now gone through the measures which appear to us to be indicated by the Report of the Royal Commission as necessary to secure the objects aimed at by them. But one thing is wanting, and on that the Report of the Commission was silent. They propose to educate the medical officer to give advice, but they do not propose to educate the combatant officer to receive it and to appreciate it. True, they fix upon him the responsibility of rejecting it, by compelling him to affix his reasons for the rejection. If the advice shall have been bad, well and good—the reasons will be given and the course will be justified; and if the advice be good, and it be rejected, the blame will ultimately fall on the right shoulders; but the mischief done in the interim may be incalculable. Authority may visit the error on the head of the officer, but it cannot compensate for the disaster. Means must therefore be taken to inform the combatant officers on these subjects, that they may be protected from their own errors, and what is more important, that those under their command may be protected from them. Our army is, perhaps, at present, the least professional of all our professions. The education for the army, and the examination previous to admission, has been as yet but very superficially military. For the first steps of promotion there is a purely technical examination, but it is of the most elementary character, and refers much more to drill and parade than to the care, management, and utilization of troops. It is an examination for peace rather than war. It

omits some of the first and highest duties of an officer, without a familiarity with which no one can be fit for high command. It is not on fields of battle alone that great commanders have won their victories. Our belief is, that unless the military authorities give to our officers the means and encourage them to acquire this knowledge and secure its acquisition by them, through the means of examination, much of the advantage which the measures recommended by the commissioners, and now, we hope, about to be adopted, will be neutralized or lost.

Add this, and it is a complete scheme, thoroughly well balanced in all its parts, which fit and dovetail one into the other.

Throughout, from beginning to end, it keeps the one main object steadily in view—namely, the efficiency of the army. The troops must be kept in health if they are to do anything. Whatever is necessary to conduce to that end, is fearlessly recommended. Whatever has been asked for, with no other object than the gratification of a class or a profession, is summarily set aside. If much seems to be done for the medical officer, it is because, with a view to secure the health of the men, duties far more onerous—far more responsible—requiring far more knowledge, are imposed upon them. Respect for their opinion is not easily obtained, unless respect for their position be also secured. In England, mere scientific attainment does not obtain the same acknowledgment that it does in France. Social distinctions overshadow them. A young medical officer joining the mess of a fast regiment for the first time, has sometimes no easy task to hold his own. He is one against many, and a large portion of that "many" are of an age and habits which do not lead to a respectful consideration of the superior attainments of others. At that happy age when the schoolboy of yesterday is suddenly transformed into "the officer and the gentleman" of to-day—when, for the first time, he finds himself able to get drunk without being flogged, and possibly to smoke without being sick—he is apt to assert his claim to manhood by imitating its vices, and to look down upon a man who neither drinks, nor hunts, nor rides races, as a sorry creature. For these social deficiencies, authority compensates by marking their estimation of the man on whose knowledge and forethought these very youngsters, when they shall have acquired (as they soon will) not only the name but the character of officers and gentlemen, will often and in critical circumstances have to depend.

On the other hand, the duties and responsibilities of the medical officer are enormously increased, but he is better rewarded if he performs them, and the opportunity is offered him of rendering himself equal to their performance, and his diligence and success in availing himself of those opportunities are tested before health and life are entrusted to his care. Security is taken so far as it

can be taken by improved and simplified organization, that his treatment shall not be debarred from success by want of the requisite appliances, nor the sick be debarred from recovery by the want of necessary material comforts. The whole scheme is left to be watched and directed in each of its parts, medical, sanitary, and statistical, by officers of the highest ability and experience that can be found, acting with and under the authority of the director-general, who will combine and be responsible for the whole. Lastly, as a check upon the whole, and as a security to the soldier and to the country, the publication, at fixed intervals, of the statistics of the army is provided for, as the only safeguard against oblivion and neglect.

We are told that the sub-commissions charged with the elaboration of the details of all these measures have all reported; that the medical regulations have been codified; that a complete scheme of statistics, and a complete organization of army hospitals has been devised; that the whole curriculum of the reformed army medical school has been prepared; and that the duties, the relative powers, and the mode of transacting business by the director-general and his council, have been defined. They wait and we wait for the action of the government. There can be no difficulty about money, for the cost of two or three councillors at the medical department, and two or three professors at the medical school, cannot be large, especially when we recollect that the irresponsible advisers in the director-general's office did not work without pay, and that the patients at Chatham must be treated by medical officers of high rank, whether those officers be also professors or not. Why, the interest of the money spent on Netley in excess of what would have built and administered a properly constructed hospital, would in itself more than maintain these officers, even were they net additions to our establishment, which they are not.

But if this matter is to be looked at as a matter of finance, and of finance alone, it is hardly possible to conceive a larger proportion of saving to be obtained at so small an immediate outlay. We are recruiting our army, say at the rate of 25,000 men per annum—at this moment it is much more. The mortality in our army has been shown to be more than double that of civil life. Our invaliding exceeds it. Whatever diminishes the one, diminishes the other. Reduce the sickness, and not only the mortality but the invaliding is diminished with it. If the health of the army could be raised to the level, or, which is the same thing, if the mortality of the army could be reduced to the rates of civil life, half of our recruiting would become unnecessary. The vacancies would have been reduced one-half; half the number of recruits would be sufficient to maintain our present force. But that view may be too sanguine, and in order to be beyond all

cavil, assume that a good sanitary system based on the reforms specified in this article, reduces the sickness and mortality by no more than one-fifth; and assume that the loss of a trained and efficient soldier can be made good for 50*l.*, which is just half the amount of estimate of the cost of a recruit, enlisted, fed, clothed, drilled, in short, converted into a trained soldier, and transported to the regiment to which he belongs, and the country at once gains an annual saving of a quarter of a million, and this is a very low estimate of the ultimate saving when the measures shall have come into full operation.

But there are other and higher motives for immediate and energetic action. Every month that is allowed to pass while nothing is done, brings into the service fresh batches of young men to whom are entrusted duties for which they have received no previous preparation. They are sent out to be taught in their turn by disaster what they have learned from no teacher at home. Their experience will again be acquired at the expense of the soldier, whose life and health are in their hands. If there be war, fresh sufferings and fresh disasters will again lower our reputation as a military nation, and *pro tanto* deprive us of the security which rests on military reputation. Every day's delay, therefore, is a loss. While these plans, matured by practised and experienced hands, are being bandied from branch to branch in the cumbrous consolidation of the War Office, not only are the evils complained of unarrested, but the seeds are being sown for their long continuance. Delay then is not only a loss but a sin, and one which we trust that the country will not long allow our rulers to commit. The army of England deserves better treatment at our hands. Its officers and its men are of the finest material which the world can show. They have undergone much unnecessary suffering, and been exposed to much unnecessary difficulty; but they have endured those sufferings, and overcome those difficulties, with a patience and a courage which have never failed. It remains for us to give them the organization and the skill which shall utilize those great qualities to the utmost, and constitute our army a machine perfect for its purpose. Then we may rest assured, that while so defended, neither envy of our prosperity, nor hatred of our freedom, will induce any nation to risk aggression or court a contest with us.

THE END.