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Lieutenant-Colonel Millington H. Synge R.E.

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# The Journal

OF THE

## Royal United Service Institution.

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VOL. VIII.

1864.

No. XXXII.

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### Ebening Meeting.

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Monday, April 18, 1864.

LIEUTENANT-COLONEL T. ST. LEGER ALCOCK, in the Chair.

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NAMES of MEMBERS who joined the Institution between the 4th and 18th April, 1864.

#### ANNUAL.

Douglas, Sir Robert, Bart., Capt., 57th Regt. 17.	Law, Robert, K. H., Major-General, Col. 2nd W. I. Regt. 17.
Holmes, H. R., Lieut., R.N. 17.	Errington, A. J. Lieut., R.N. 17.
Baldwin, G. W., Major, 20th Regt. 17.	Clayton, V. G., Lieut., Roy. Engrs. 17.
Scott, J. D., Colonel late Mad. Art. 17.	Saumarez, Hon. James, Lieut., Grenadier Guards. 17.

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### THE CONSTRUCTIVE SERVICE OF THE ARMY, OR MILITARY WORK BY MILITARY MEANS.

By Lieutenant-Colonel MILLINGTON H. SYNGE, R.E.

The CHAIRMAN: As the lecture which we are about to hear from Colonel Syngé is likely to be followed by a discussion, I will take this opportunity of stating that as these discussions are of considerable importance, and interesting to members in every branch of the service, we are very anxious that our reports should be accurate. When gentlemen are kind enough to address the meeting, we can easily afford them the opportunity to correct the proofs; but we must pro-

vide against those corrections which amount to what is usually called a "revise," because a "revise" greatly increases the labour as well as the expense of publication. It likewise retards the appearance of the Journal, which is, to our absent members, a matter of regret. The subjects discussed at these meetings are usually those of the day, and absent members are anxious to hear the opinions of distinguished and experienced officers upon them. It is, therefore, a matter of much importance that our Journal should be issued at the proper time. Gentlemen are aware that we spare no trouble to conform to their wishes, but we are obliged to lay down this rule in consequence of the increased amount of labour occasioned by prolonged discussions, such as I hope we may be favoured with on the present occasion. I will now call upon Colonel Syngé to commence his paper.

Colonel SYNGÉ: I. An army, to be perfectly equipped, ought to include *within its own constituent elements* a full provision for the supply of all its wants, and for the performance of all its duties.

The efficiency of an army is necessarily always in proportion to the completeness with which this provision is made and carried out.

The organisation for an army *must* make such provision, or failure at some stage is the inevitable result; but an army is incompletely and imperfectly equipped, if it does not include that provision *within its own organisation*.

II. Moreover, every arrangement made in connection with an army should be viewed in its relation to the primary object and paramount end of all armies, which is, fighting power.

III. Again, the arrangements should be confined, as strictly as is possible, to that which is essential. Whatever contributes to the essence of the army, in other words, whatever contributes to its fighting power, and is essential, should be provided, and nothing that does not.

Any provision made, or any arrangement introduced, that fails in this respect is necessarily injurious to the extent that it is made or introduced, but everything that does so contribute should be provided fully, and should be made available by an instrumentality as simple and as direct as possible.

IV. Every complex arrangement is in itself to be avoided, and bespeaks its own condemnation in its complexity.

Needless complication cannot be too strongly condemned.

Fighting power, the essence and object of armies, is determined by number and quality. These, therefore, should be the objects constantly in view, and no arrangement that fails both in increasing the number and in improving the efficiency of the army ought to be admitted.

The works required for the maintenance and by the duties of the army furnish preeminently an occasion when these maxims ought to be regarded in practice. The expenditure must, in any wise, be incurred, for the works must be supplied. If this be done by an instrumentality available as a combatant force, the same expenditure by which the works are supplied will besides both increase the numerical strength

and add to the efficiency of the army. Such would be, in every respect, the most economical means.

The whole strength of the army is not required to exceed that by which the duties for which it is wanted can be performed, and its own necessities supplied.

The constructive requirements are in like manner limited to those connected with the duties, or consequent upon the existence of the military force. It is clear, therefore, that the aggregate expenditure for military purposes is brought within the smallest possible compass, as well as most efficiently applied, when the same expenditure which supplies the constructive requirements, furnishes, also, in the act of doing so, a portion of the military force.

This may be briefly summed up in terms that carry conviction with them,

**MILITARY WORK SHOULD BE DONE BY MILITARY MEANS.** Plainly, if the work that is now done by a body of men who are not available for military service were done by a like number that would be so available, the numerical strength of the combatant force would be increased to that extent.

So, also, to increase the efficiency of the units of which the aggregate of the army consists, is to increase the efficiency of that army as a whole; and to call into exercise the intelligence, resource, and physical energies of those units, is to increase their individual efficiency.

If officers and soldiers can plan the works and buildings required by their duties; if they can superintend the carrying them out; if they can execute those works, it may assuredly be affirmed, besides, that no other instrumentality can be so well cognisant of the true and actual nature of all military requirements; neither, in all probability, could those requirements be met at once so readily or so completely by any other instrumentality.

The combination of the structural and combatant functions is, if it be practicable, the perfect attainment of the end in view.

The chief practical aspects of *this* question are:—

First, from the military point of view, the effect upon the soldier of employment on military works.

Secondly, from the constructive point of view, the value of military labour in getting work done.

The soldier is affected (a) personally,  
(b) in discipline, and  
(c) in pay.

Can his employment on military works be combined with the necessary exercise and discipline of his calling and with economy? Will the receipt of greater earnings militate against his subordination and discipline? What will he do with the wages of his work?

The partial employment of military labour in the design, the superintendence and the execution of works, is an established custom. It takes place, to a greater or less extent, probably in every Service known, and the men so employed are conspicuous rather for higher than for inferior military bearing, proficiency, and character.

It is a question, therefore, of enlarged detail and practice, more

than of novelty of principle,—of the feasibility and probable results of extending the sphere of operations of a system, the effects of which can, in a great measure, either be stated from actual experience and fact, or accurately inferred from close analogy. It is not the suggestion of anything untried.

First, then, as to the soldier's individual efficiency and value.

Variety of occupation and active bodily employment bring into use all the different muscles of the frame, and thereby conduce not only to bodily health but to suppleness and usefulness, changing and correcting the somewhat stiffening tendencies on both mind and body of the habits into which the less intelligent and active men are but too apt to fall. Thus the sanitary condition of the cavalry is, as a rule, superior to that of the infantry, and this often, notwithstanding less favourable surroundings. The Royal Engineers have a less proportion of sickness among their numbers than the ordinary regiments of foot. The difference is so decided that it affects the mortality as well as the effective states of the several bodies. In other words, handling the currycomb and brush, or the use of the spade and pickaxe, and the employments of artificers and labourers, are beneficial to the health and longevity of the soldier. This is a matter of no little importance, when it is considered that a soldier of the line is estimated to have cost £60 before or by the time his training is complete.

Intelligence, which cannot fail to be developed by practical training in even the ruder kinds of skilled labour, more especially when the whole course of that training is directed towards supplying particular and personal requirements, is of great military value. The highest authority has affirmed that it is more effective than a great amount of drill towards perfecting the soldier as a marksman, in enabling him to choose and to adapt his position so as to place, use, and point his weapon to the best effect. It has been similarly determined that intelligence, activity, and the habit of exercising faculties of resource certainly best attain the important objects of light infantry movements, of which the execution depends upon the qualifications of each individual in these very particulars.

[Will you allow me to interrupt the lecture by a subject that probably may not arise in the discussion. When my paper was drawn up some years ago, it was based upon the experience in this respect of the previous Hythe practice. When that practice was first set down and tabulated, the Royal Engineers took a very high average. We have since very much fallen off, to the surprise of many of my brother officers; but I believe a simple explanation that has been suggested to me will meet the case, and I mention it here because I am not aware that it has ever been brought forward publicly before. Musketry instructors state that men of intelligence make the best marksmen; and the higher intelligence of the Royal Engineers probably made them better marksmen than the men of other regiments in the first instance. But other regiments are constantly practised in this one particular, and this constant practice would be altogether wasted, and fail in its object, if it did not at last give these regiments a higher relative position, putting out of consideration the fact that

the Royal Engineers are supplied with an arm of which the ammunition has now a different\* windage. Quickness, intelligence, and education will tell; but when so much attention is devoted to one particular object, that is education in that matter, and it would be a melancholy reflection if no corresponding result were attained. If so, it might be argued, the less musketry drill we had, the better, which were going too far altogether, and I think the suggestion offered explains in a great measure the falling off of the Royal Engineers in their comparative standard and their figure of merit that has been noticed.]

In all these respects the soldier's efficiency and consequent value will have been increased; and so far as his abilities and general aptitude have been improved, he will have become more rather than less amenable to discipline. Neither will the *habits* of discipline deteriorate under a thorough and complete military organisation and system of carrying out the works. The maintenance of drill can be perfectly provided for by an adequate allotment of time specially determined.

In fact, the discipline of the soldier is only liable to be injuriously affected, if so liable at all, through the effect upon him of the receipt of wages for work done.

The classes of the army that under a military system of executing works would be in receipt of this increase would be, first, a proportion of those men by whom the works are executed at present as civilians, or others, of like standing and similar qualifications; and, secondly, a proportion of the existing army. With the attractions of permanent and fixed employment, and of the opportunity of rising to masterships of their own trades, to grades of overseerships, to duties of superintendence or of design, no doubt a considerable number of the former would enlist, if only the detail of the code of regulations be judiciously and equitably devised; so that the position of a man, in other respects yielding precisely the same service as civilians now do, should not be deteriorated in his very employment, as is now frequently the case, merely because he also served his country as a soldier. Of this body the artificers at least are superior to the general class of men who now enlist, and in so far, the addition to the army would not be of numerical strength alone, but markedly of efficiency and value. In fact, were it determined to procure the enlistment of a better class of men than is obtained at present, the means employed would be an increase of bounty and of pay, and a well-grounded expectation of improving prospects. It may therefore be fairly assumed that on the establishment of these conditions, their favourable influence would be felt by the army generally, although they had not been adopted primarily with that object, but were simply incident to the extension of a military system for the provision of works.

With regard, secondly, to the proportion of the existing army that would be directly affected, it must be conceded that, inasmuch as the invariable demand of all agencies that seek to promote the amelioration of any class of society is for money, the presence of money in the question is at the least not necessarily unfavourable to its satisfactory

\* I believe it has been recently decided that the windage is a chief cause.—M.H.S.

solution. The matter really to be considered is, how the soldier can be induced to make a good use of his earnings in a manner consistent at once with his absolute property in the same, and also with his discipline and with his position as a soldier.

If opportunities can be set before him for the investment of his earnings in a manner alike beneficial to himself and to the state, and if inducements strong enough to cause him voluntarily to act upon them can also be brought to bear upon him, the object will be attained.

It is not difficult to point out an opportunity and an inducement of sufficient force. These can be afforded the more easily, since the numbers employed upon works would always be but a certain proportion of the whole army. The privilege of being so employed could therefore always be withheld from such men as were found to make a bad use of their earnings, or to be unwilling to adopt the approved arrangements.

Giving the soldier of a certain standing greater liberty of marriage, throwing upon himself all the consequent expenses, would afford both the opportunity and the inducement. There are grounds sufficient for inferring that such liberty would act as favourably upon the general health, strength, and morality of the ranks as it would be effective in reducing the unproductive expenses of that portion of the service. The additional requirements of a married soldier form, in fact, the barrier that restricts the permission to marry to a very small proportion. These additional requirements are, increased accommodation in barracks or quarters, more medical attendance and additional transport. These, as is obvious, can all be met without great difficulty, *in the presence of adequate funds*, merely requiring judicious regulation. The execution of works would supply those funds; and meeting these wants would be their best investment by the soldier.

No doubt there are many officers, and amongst them officers of much experience and of well-earned reputation, who look upon the possession of money by the soldier as his greatest temptation and misfortune, and who would be disposed to look with little favour upon propositions for giving greater liberty to marry. They hold that as a rule the soldier is the scamp of the town or the refuse of the village, with tastes bounded, at the best, by the canteen. There are officers on whom their own experience has worked a strong conviction, that a brave and useful soldier may yet be in all other respects a thorough blackguard. Indeed, it is not very long ago since a proverb was rife closely connecting infamy of disposition with value as a soldier. If this be the right view, nothing can be said. All projects of amelioration are alike hopeless. Far from being brought forward, the soldier ought to be removed from every place of trust, even in his own profession, wherever it can be done. A class that could be viewed only as an inevitable evil, which in times of peace and prosperity has been called so bitterly and so contemptuously a shilling's worth of food for powder, ought to be limited to the smallest number possible; but if this be the correct view, there are quite another set of votes to be dealt with. The educational and sanitary projects, the whole esta-



ishments of chaplains, and the vast machinery and outlay which have been the work of recent years for the improvement of the soldier, ought in all consistency to be abandoned without farther loss.

There is, however, quite a different and a better light in which to take these votes. They show that a better and a sounder opinion prevails even now, of the real characteristics of soldiers, a truer standard of what they ought, and may be helped, to be. These votes are the result, moreover, of the increased interest in and attention to military matters which the events of recent times have forced upon the country. Nor are these very opposite opinions so irreconcilable as at first sight they may appear. Ordinarily a man is very much what circumstances and inducements make him. Granted that a casual sum of money may prove the occasion of the greatest misconduct of a soldier with no other inducement to its outlay than the canteen can offer,—granted that some commanding officers may conceive themselves borne out by every instance within their particular experience of the bad effects upon the conduct and discipline of their own regiments, of sums earned on occasions of working parties having been furnished, yet it would by no means follow that any like result should attend the systematized and constant employment of military labour upon military works.

Quite the reverse. Else the Royal Engineers, the Commissariat Corps and the like, would be the worst and not the best conducted and most trustworthy components of the army; and similarly, the Guards and cavalry, with higher rates of daily pay, would be inferior to the line.

The soldier will do with the wages of his work very much like any other man, what he may have the opportunity of doing; what he may be judiciously induced to do. If hitherto he has spent his chance earnings at canteens, has it not been very much the consequence of circumstances? In part, because they were *chance* earnings; in part, because the temptations of the canteens were at hand, not so any definite want or inducement to exert upon him the force of a less unfavourable influence.

The foundation of the manliness of the English character, the essence of its greatness and its strength are, perhaps, speaking of qualities alone, its self-reliance and its independence. The feature that peculiarly marks our military administration has been to do everything, and, as it were, to think every thought for the soldier. He is brought not only to habits of absolute obedience and of perfect discipline within the duties of his calling, but beyond the range of these he has been practically very much reduced to the conditions of helplessness and childishness.

His marrying has, as a rule, been necessarily inhibited. His chaplain, his school, his library, his reading-room, his ball courts and his canteen, all are provided for him. It is only at the last that he is called upon to spend his own money, and to bring his own faculties into exercise before he can make use of the establishment.

I do not wish to be misunderstood. Since this paper was drawn up, there have been many modifications. Soldiers now subscribe to

reading-rooms, and to other similar improvements. Still the canteen remains a prominent attraction; but the observation hardly now holds true, that it is *there only* a man must exercise his faculties and choice.

Yet, notwithstanding the general inhibitions of marriage, the proportion that are allowed to marry, and the proportion that marry without leave, form, with the consequent number of children, one of the most difficult elements of the army to deal with satisfactorily. Small and insufficient as that proportion relatively is, it crowds a barrack, or else renders its construction enormous. It is in the way in the allotment of camp accommodation; it is *the* difficulty on board ship. On the march, or on embarkation, many women and children are necessarily left behind; many families become destitute and fall a burden upon the Government or upon the parish. Yet the large unmarried proportion of the army does not generally yield the oldest, the best, the steadiest, or the most trustworthy and available soldiers; but it *does* furnish the principal ingredient of the hospital and of the military prison. An ingredient so large, so important, so damaging and so costly, that it has been found that a proportion as great as one twenty-fifth of the whole army is permanently supported either in the hospital or in the prison, unavailable for service and heavily encumbering the estimates, utterly unprofitably.

The employment of military labour on military works opens a solution to these difficulties. It affords the opportunity of throwing the expenses incidental to marriage, upon the man himself, as is the case in every other condition of life. The service is freed from the responsibility and the Government from the burden, of providing them, whilst the soldier himself is put in a position to earn and to provide them. In fact, the pressure that is now experienced has been caused in a great degree by the soldier having had no opportunity of making any such provision, whilst continuing his military service. It has resulted from an artificial practice, that has shut him out from a field of legitimate employment, and which has inevitably carried with it other restrictions, artificial consequences, forced necessities, and mischievous habits. When this practical prohibition is discontinued, and military labour resorted to within its proper sphere, these evils will also cease. The soldier will be placed, in respect of his domestic life, upon his own industrial resources. He will be enabled to supply and satisfy his own wants. No means has hitherto been practised; he has either been refused the habits of natural life, or he has been supplied at the cost of the country with the necessities consequent thereupon. He has either been forbidden to marry, and condemned to an unnatural celibacy, or his wife and children have been housed, fed, schooled and physicked at the cost of the country. These extremes and this anomaly may be ended, the moment the soldier himself is placed in a position to meet the expenses of providing for these wants. The experiment of throwing the soldier more upon the result of his own exertions has succeeded to the extent that it has been tried; the employment of military labour seems admirably adapted to its wide extension. In particular cases soldiers married with leave have been accommodated with quarters under light payments. The supply

of rations at fixed charges is on the same principle. Similarly if quarters in or adjoining to barracks and camps (with a garden ground where practicable) were let to married soldiers at rents, light but still remunerative, and if by an arrangement similar in principle, the transport of his wife and family to his station for garrison duty were provided (not necessarily in the same vessel as himself), or that family allowed at his option to remain in the abode they rented at the time of his departure, or in one similar, the service would be freed from the greatest impediment and hindrance to the quick, easy and compact movement of troops. The free percentages already conceded, could still, if it were desired, be provided in the quarters or in the ships, under fixed charges for the others. Such an arrangement might be made with advantage both to the country and the service even as it is, for it is the helplessness of the soldier and his ignorance of civil life, which, together with the avaricious and passion-pandering characteristics of those who generally inhabit garrison towns to make their prey of him, that complete the position in which he falls under the influence of the canteen or drinking shop, exercising no thought beyond the moment, and without help in the hour of need.

In like manner with regard to the younger and unmarried soldier, a more extended system of recreative amusement,\* both in the way of bodily exercise and of mental cultivation, would afford a wide scope for a beneficial expenditure of his working pay. For example, *his own* ball-courts, cricket, and game grounds of all kinds, with refreshments, all under judicious regulations, but in measure or wholly originating in his own resources, and under his own management—the more thoroughly under his own care and management the better; his reading-room and library, his club, in fact, similarly governed, would doubtless be found full of fresh attraction.

A fund, to which contribution should be compulsory on all allowed to avail themselves of the privilege of going on the works, would meet the cases wherein the misconduct of individuals, after being allowed these indulgencies, would have otherwise involved the country in expense. A proportion of their contributions to this fund, greater or less, according to circumstances, might be repaid to men on their discharge after a term of unbroken good service, which would probably cause the fund to be approved by all, excepting such as might forfeit their share on transfers, or by any other expenditures, incurred through their own misconduct. To others, it would prove, in fact, somewhat analogous to a savings bank, and it would be the common interest of all to prevent this diminution of the fund through misconduct. Thus, both in the case of the married and the unmarried man, the execution of military work by military means, far from exercising a deteriorating influence on the discipline or habits of the soldier, through the wages received for work done, affords the means of solving, without involving the country in any additional expense, one of the most difficult problems in the management of the army, as well as the opportunity for carrying out military life in accord-

\* Recreation rooms are carried out upon this plan with the best results.—M.H.S.

ance with the laws of nature; yet it would at the same time both greatly reduce the non-effective expenses of the army, and facilitate its accommodation in barracks, as well as its movements on ordinary service, nay, even on active service, in so far as it would leave the soldier's family better provided for when he himself was called away from beside them.

Next, as to the value of military labour in getting work done. Under this aspect, the question is simply a consideration of relative cost and of sufficient workmanship. In viewing it, however, from this exclusively constructive and civil point of view, it is very necessary to bear in mind that the result arrived at must be modified by the value to be attached to skilled labour, as an essential and indispensable ingredient of an army before the inquiry has been practically dealt with in its completeness and truth.

Moreover, in instituting the comparison itself between the cost and quality of civil and of military labour, it has to be remembered that the regulations which now affect the latter are, as it were, incidents merely in the code of military rule, and that they have not been framed with the primary object of using the labour of the soldier to the best advantage.

A comparison, however, has been instituted under these conditions, which are necessarily less favourable to military labour than would be the case were it generally employed, and adequately organised for that end. Sir J. Fox Burgoyne has published, in his "Military Opinions," the very careful analysis given in full detail by Quartermaster Conolly, of the Royal Engineers, who has written the history of the late Royal Sappers and Miners. It appears from this analysis that the entire cost per man on a company of Royal Engineers, does not exceed 3s. 4d. a day each, when every expense has been included of bounty, drill, instruction, barracks and hospital accommodation, provisions, working pay, clothing, and pensions. Quartermaster Conolly shows a saving of £614 15s. annually on the employment of a company of Royal Engineers, instead of a corresponding number of civil artificers, of the trades which constitute by regulation a company of Royal Engineers.

[Since I have taken this from the sources quoted, I have seen compilations made by brother officers on entirely different data, thrown together differently, yet resulting exactly in the same amounts. This is corroboration, although it may be said, that corroboration on a subject like this that Sir John Burgoyne has adopted and given his countenance to, is like "painting the lily, and gilding refined gold."]

Upon this, General Sir John Burgoyne observes:—"As the work must be performed, and as the engineer soldiers are intended to be habitually employed in work, it is evident that the difference of cost of what is performed by them from what it would be by ordinary means, will mark the *bonâ fide* expense to the country of their maintenance."

Since the work must in any wise be done, the result is practically that the country obtains the war services of as many men as are employed upon works in time of peace, not only virtually free of cost,

but at a positive saving, which on the aggregate of works would amount to a very considerable sum. These men are besides of higher average individual intelligence than those who usually enlist; they become trained soldiers, they are taught the duties connected with the operations of an army in the field, and more particularly at a siege; but notwithstanding these admitted facts, military works are principally carried out by civil instrumentality throughout, whilst the number of these combatant men maintained is only 40 companies, or 3,818 men, (exclusive of two troops, or 4,294 in all) or about one-fifth that of the Royal Artillery, two-thirds that of the Foot Guards, and is very nearly equalled by the rifle brigade alone.

According to the authority above quoted—and none could carry greater weight for accuracy and experience in this matter—the saving in executing military works by the Royal Engineer soldiers instead of by corresponding civil artificers, would be, by the analysis afforded, about 8 per cent. It has indeed also been said that this comparison is instituted with a class of artificers somewhat superior to the average of Royal Engineers; but against this must be set the fact that in the extensive adoption of military labour a large proportion of that required, could be and ought to be furnished by a class less costly than the artificers of the Royal Engineers. There is in every regiment a number, greater or less, of men, who although not absolutely capable of executing artificers' work independently, are quite able to work under trained artificers, of acquiring a good degree of handiness, and of becoming at the least more full of resource than they are on their enlistment. They are well fitted for helping in rougher kinds of work, and for acquiring an aptitude invaluable in the emergencies of actual service. To men of this description, who are of a class especially calculated to make good soldiers, the prospect of employment on military works would be as attractive as it would prove beneficial to the service, so that whilst the combatant force would be added to in one of its most valuable elements, the work suited for execution by such means would be performed by the instrumentality most appropriate, and in part less expensive than that on which the above comparison has been based.

Contract, however, and not the direct employment of civil artificers, is the system almost invariably pursued. This circumstance introduces another element of uncertainty in estimating the positive relative cost, but it is probable that the expenses involved in the contract system are in some cases in excess, and in others below those on which the above estimate of civil artificers has been based.

Be this as it may, and the *amount* of saving that would ensue proportionably difficult to determine, it can but too easily be shown that the merits of the question do not rest upon absolute accuracy in this particular. The army estimates for this year, 1864-5, amount to £14,844,888, of which the charge for the effective services of all kinds, exclusive of militia and volunteers, is £11,579,802. That for works and buildings is £750,870, and any instrumentality which would reduce so large an expenditure, were it only by a very slight proportion, is as deserving of consideration for its financial bearing on the

aggregate army estimates, as that proposed has been shown to be to military economy, and to the soldier's general efficiency and well-being. This is clear, for assuming that of the £750,870 for works and buildings, one-half only represents payment for labour, and that the rest is for materials, in which there would be no change of cost, the employment of military labour would yield, *first, a combatant force equal in numerical strength to the number of civil artificers and labourers employed throughout the year*, and of the qualifications of the Royal Engineers; *and, secondly, a saving varying respectively at ten, five, or one per cent., from £5,000 to 25,000, and £50,000.* At fifteen per cent. the saving would be £75,000 a-year.

As has been already said, however, the true value of military labour in the execution of military works must not be tested from a financial point of view exclusively, be the result ever so satisfactory, or rather if it be so tested, it must be on a full view of the whole case. The indispensable necessity of skilled labour in modern warfare must have the weight and prominence which are its due. The extent and quality of skill that, if not altogether indispensable, it is yet of the utmost advantage to have at command, must also be considered. If the question is to be determined as a matter of finance, the monetary value of such skill and practice in the emergency of war, and that of the best school for procuring and for maintaining it must be added to the score.

THE DESIGN AND SUPERINTENDENCE of the works required would supply and cultivate the higher portions of this skilled labour. Upon the mode of carrying these out must depend in a great measure not only the success, or otherwise, of the military execution of works, but also whether or not a large body of officers, non-commissioned officers, and men, is to be maintained, trained, and employed to the greatest advantage, and available at any moment, with matured experience, for active and immediate service in the field.

Superintendence must necessarily be carried on either by military, civil, or by mixed means. A wholly civil instrumentality need scarcely be discussed.

The requirements and constitution of an army necessitate, at the least, a military admixture. Military men must, or certainly ought to be, better acquainted than others, both with the wants of the service and with the best ways of meeting them. Officers conversant with the operations of a siege, and with many other matters of field service, are indispensable. These must clearly be trained in time of peace, and their general services ought also to be then available. To supply this indispensable need, and to provide this training, the corps of Royal Engineers has been formed and organised, and placed in charge of all fortifications, with the buildings and lands attached, and of the superintendence of the execution of all works and buildings.

Owing to the great preponderance of the execution of works by civil means, the officers of this corps are in point of numbers proportionably in excess of the corps of artificers whom they now officer under a common name; but the non-commissioned officers of this body ought to be similarly qualified to conduct the subordinate duties in the super-

intendence, and their employment in this manner, a practice already in partial operation, might readily be organised so as to be attended with great advantages.

If these together be in sufficient number, there is evidently no need of the addition of a civil admixture, and the latter can only be introduced to supplement some deficiency, real or supposed, in number or in qualification.—[See Appendix A.]

The substitution of a military system is rendered comparatively easy, inasmuch as the present system has in all respects a partially military organisation; and a gradual increase of the military features would effect the transition to its complete adoption in the best manner. Thus carried out, no injury whatever would be inflicted on so much as the prospective interests of any of the civil assistants on permanent employment; and no additional expense would be incurred even at the first beginning of its more extended application; no difficulty, shock, or inconvenience would be felt in the working of an existing system, as there would be no sudden substitution of either one class of persons or of duties for another. The transition might be begun by replacing the civil temporary appointments, of which 87 appear in the estimates, by as many military substitutes as might be found at once available and competent for the purpose. The employment and promotion of the permanent civil assistants being carried on with no other change than the cessation of new civil appointments at the bottom of the lists, their interests would be left entirely untouched, and their services would be available as now; only they ought to be placed exclusively as assistants to senior officers, where they would be *assistants*. And they should be employed in training to the duties of superintendence, and to the minutiae of plans and estimates, the best tradesmen amongst the non-commissioned officers and men, precisely as they now do their civil juniors. They have themselves been trained in this manner, and have thereby become gradually familiar with the general duties of the service after their own special apprenticeships in their previous civil life.

In order fully to obtain the advantages that are to be derived from the employment of military labour in the execution of works, both in respect to the labour and the men themselves, a brief code of regulations is required, framed with especial reference to these points, and to the co-operation, or the reconciliation, so to speak, between military duties and the employment of labour to the best advantage. The former of these objects, that is, the due performance of military duties, has frequently been quoted as an insuperable obstacle to the perfect attainment of the latter. All, however, that would be necessary in order completely to secure it, would be, to determine first the amount of military duty necessary to be performed, and then to carry it out subordinately in point of *time*, to the particular work or job on which the man, squad, company, detachment, or regiment might be employed; the *amount* being absolute and paramount, but the *time* or roster varied under the orders of the officer commanding, according to the work actually in hand. Although carried on at special times and in special localities, the course of musketry instruction now in force

does not militate against any other of the soldier's duties. The principle of the two cases is not dissimilar.

To promote diligence and good workmanship, and an effective control over the working parties, a revised scale of pay, ranging, it may be, from 3*d.* to 1*s.* 6*d.* a day, is necessary. Day, task or job work should be alike authorised at the discretion of the officer commanding the works. To meet cases of misconduct, and to maintain employment on the works as a privilege, men abusing this privilege should be liable to be transferred, until restored, to companies or regiments debarred from such employment; and a clear distinction, both in duty and in liberty, should be maintained between such cases and that of others likewise not upon the works, but that from choice or from honourable causes. There should be besides a clearly defined system of promotion to the positions of master tradesmen, and to duties of superintendence and design. Both in rank, by warrant, and in the higher grades of non-commissioned officers, and in pay, these positions ought to be made as well worth attaining as is properly called for by the duties to be performed. The effect of such a warrant and of such new regulations upon enlistment can scarcely be questioned.

At the same time, no additional expenditure would be incurred, because it is proposed that the military, as well as all other expenses of the men executing the works, should be defrayed from the cost of those works estimated according to the present system, and from the expenditure now incurred on the existing system of supervision. On the other hand, it is not intended that the whole reduction that might ensue through the substitution of a military system, should be treated as a saving; but that a proportion of it should be devoted to preparing for its extension and for perfecting its application, as well as for ensuring a due remuneration and a sure prospect of advancement to those who qualified themselves in its several gradations of duty.

With the exception of the very small present number of Royal Engineers, no account is taken of military labour in the strength of the army voted in the estimates. That strength is determined entirely on other considerations. Accordingly it is not proposed to entrench for the performance of the additional duties occasioned thereby upon the force deemed necessary for other purposes; but, as has been explained, the army would be added to to an extent equal to the number of men required and found qualified and available for the execution and supervision of works. Probably it would be best in the first instance to add the increase of effective force thereby obtained to the existing companies of engineers. That body is, as has been shown, not only disproportionately and disadvantageously weak in point of numbers, but the advantages and prospects that would be thrown open to first-rate artificers through the expansion of the system of the military execution of works, would enable not only the number, but also the qualifications of that body to be raised more and more, both to a higher standard and to a more uniform attainment of that standard.

In its degree it is an object almost as important to impregnate the



whole army with the spirit of work and of well grounded self-reliance, and to extend as far as possible to the whole that general aptitude for the emergencies of war, and to throw open to the whole those advantages in time of peace, that have been already considered. A real head-quarters for the Royal Engineers would almost be rendered necessary by, and might not be among the least of the advantages arising from, the military execution of works both in respect of duties of peace and those of war. By this means, among others, the high training received by the officers in early life would be maintained, and its effects fostered and turned to account through life. This head-quarters should also be the resort of other officers, and, at stated times, of other troops, who should be collected for joint operations by the several branches of the service, on a legitimate and proper scale.

It may admit of question whether the addition of the labourer's part should be made, except in limited proportion, in the same manner, or embodied in additional regiments or in special companies of Engineers, or attached to that corps. A mere numerical addition to the army would seem sufficient for the purpose. The authorised adoption of the system would lead, as to a natural consequence, to the stationing of a proportion of troops, with especial reference to works in execution or requiring maintenance (more particularly at the larger stations, and always, be it remembered, free of additional expense). This would enable working parties to be habitually drawn from regiments without in any way diminishing the strength at present concentrated for purposes of joint drill, and by adopting the principle of time and of rotation by regiment, company, or squad, according to the nature of the case, without disintegrating any sub-division of that force. It would also extend to every regiment, according to the use it made of the opportunity afforded, a portion of the advantages thrown open. It might be advantageous to both officers and men to draft the men taken from regiments into companies temporarily attached to or amalgamated with the Royal Engineers, particularly when their services were wanted continuously, or that they were partially qualified for skilled labour. On the departure of regiments from a station, or for foreign or active service, the trained men might be returned to the regiments, or not, by the decision of the Commander-in-Chief, according to the destination and the nature of the case. The deficiencies caused by the temporary or permanent transfers having been meanwhile filled as is now done in similar cases on a limited scale, the numerical adjustment would be maintained on the return of the trained men by the withdrawal of an equal number of men who had not been upon the works. The services at minor stations might be readily performed by an organisation similar in principle to the Coast Brigade of Artillery; so also as to barrack damage and hospital repairs and a great deal of store charge, at a great reduction both of cost and of complexity of arrangement.—[See Appendix B.]

In closing these remarks it may perhaps with propriety be added, that scarcely under any possible conditions could an accession of strength derived from a costless increase in the number, and from an aggregate improvement of the individual members of an army, be of

greater importance than in those which form the actual circumstances of Great Britain at the present time, with a comparatively small amount of population, an enormous and wide-spread territorial empire, and upholding and dependent for her very being upon principles of conduct alike removed from despotism and from anarchy, in the support of which she stands almost or entirely alone. Since she maintains, moreover, an increased military force, and incurs an increased expenditure for military purposes only under apprehensions of unusual magnitude and severity, the difference should not be forgotten, both as regards the country and the men themselves, between large bodies of men returning to the civil avocations of life (whether under the operation of limited enlistment or upon reduction) who have either become, as it may be feared is too often the case at present, in a great measure unfitted for all but the habits of the profession they have quitted, or who under the system proposed will have been exercised in various branches of industrial pursuit, and who not improbably will have become better citizens and subjects than they were when they first adopted a military career.

Lastly, I wish to say but a few words, not so much with a view of seeking to refute objections, as to prevent objections being raised on misapprehensions through want of explicitness on my part.

My proposition is, that it is better and cheaper to do military work by military than by either civil or mixed means.

Better and cheaper, among other reasons that have been already advanced, because two ends, as it were, are then accomplished by a single means, for officers and non-commissioned officers perform the military as well as the structural functions of their respective offices, whereas now two means, one military and one civil, are employed to attain, or it may sometimes be, to obstruct a single end. All expenditure incurred would tend at once and directly to its immediate end, and to the final end of all military expenditure whatever; viz., fighting power.

My illustrations are taken from existing facts.

My reasoning is limited to advocating the doing on a larger scale; what has been proved to answer under restrictions and disadvantages, nevertheless, the suggestions I have now had the honour of submitting to your consideration have not been hastily formed or adopted: on the contrary, they embody convictions and opinions the result of my whole length of service, such as that is. Neither have they been thought on, elaborated, or brought forward in any partizan spirit or personal interest.

They are not advanced for the sake of benefit to either Engineer officers or men, although I believe, if adopted, they would have that effect and that tendency.

It is not so much in even the interests of the army at large that I wish to bring them forward, as because I believe them to be founded on plain and simple, but, at the same time, powerful and important principles, and that they would have the results I have stated. I respectfully urge upon you their consideration, chiefly because what, ever would increase the positive efficiency and the numerical strength

of the army with less rather than with increased expense, is, more especially in this eventful era, of interest and importance to every Englishman and to the whole country.

If I am right, moreover, in my strong conviction, that industrial training and practice are calculated to make the soldier a better subject than he was before, I do not think that the improved esteem in which discharged soldiers would then be held, and the reactive and insensible influence of this again upon enlistment, and so upon the army, ought to be forgotten.

In claiming, therefore, through your influence the consideration for this subject which I believe it to merit, I am peculiarly anxious not to be in any degree misunderstood.

I can imagine objections almost without number; but they are objections founded on an incomplete view of the whole.

It might have been assumed that I sought to benefit the corps interests of the Engineers, and so indirectly my own. I do not acknowledge the charge.

It may be said, I give a preponderance to the army at the expense of doctrines of political economy. The supposition would be, I believe, equally fallacious.

The military works wanted are but works wanted by the country, and necessarily supplied from its resources. The artisans of the country can then be nothing injured by a proportion of them being induced by advantageous terms to yield military service as well as their skill; but powerful inducements to good conduct, acting on a numerous class, must benefit the community at large. The opposition that has on occasion been raised against military labour is, in truth, far more opposed to common fairness as well as to sound political economy, and has in it far more of the spirit of dictation, of caste, and of self-seeking. It is an attempt on the part of powerful sections to prevent others from the exercise of the same crafts and of the like abilities: a spirit and an attempt that ought to be refuted and discountenanced, and not yielded to or encouraged.

Should it be said on the part of the army that its members enlist to fight and not to work, I can have laboured to very little purpose if I have not made it clear that all my aims and endeavours are to refute the spirit of this objection; that it is my whole object to enable the army to fight to better advantage,—to increase, as I have said, its fighting power in respect both of number and of individual and personal efficiency.

If it be said by any of my military brethren that I have sought to add a new and onerous duty and responsibility to our present labour, I must not and I do not wish to deny it. Carrying out work throughout, from its first design to its final completion, is a very different thing to supervising contract work with no interest in the men and no responsibility in the work beyond that of approving or condemning what others have to do. I have not sought to make Engineer duties more light, but to suggest a Constructive Service soldierlike, efficient, and complete for every part of the constructive duties required by the army.

Possibly some civil engineers, all of whom do not, I fear, display at all times the candour and courtesy towards their military brethren which, I trust, they invariably receive themselves at their hands, may be disposed to dispute the capabilities of the military service to furnish the requisite ability or the technical knowledge. I trust I have sufficiently met this point by that part\* of my paper which deals more particularly with it, in the system of training and of gradual substitution not to have now to institute comparisons, nor to press the general qualifications of a body to which I have the honour to belong: I prefer altogether to waive this point, not caring to discuss it, because it is not essential to the subject. No one, I presume, will dispute that a military body may be formed capable of doing all its work, even were there no such thing at present. Moreover, it must certainly be conceded that this straining for assumed excessive technical attainment scarcely seems to be countenanced by the high authorities whose decision determines these matters, at least as to that part of the duties under consideration that relates to maintenance, and is now done by civil means, inasmuch as precisely the same kind of work which, if done as an Engineer service, would be subject to the technical skill and complex machinery of that department, is deemed sufficiently provided for without either one or the other when entrusted to barrack-masters or purveyors instead.

The civil assistants now in employment may be disposed to view with little favour a proposition for nothing less than the eventual abolition of their order; but all their interests, present and prospective, are carefully preserved and their services are retained, only they are placed to the best advantage. There can be no question as to procuring military substitutes in the manner proposed, for they can be obtained already. Some at least of the existing military foremen of works taken from the Royal Engineers are more than ordinarily efficient, and will bear comparison with any other class most favourably.

My object, as I have said, is not to advance corps interests of any kind, but to see army constructive services effected in what I believe the best manner possible. Just as these can be best performed by an entirely military organisation, they would, so done, form so excellent a school of military adaptability and efficiency of all kinds and for all grades, that a twofold injury is inflicted when they are not so done, and such a school is practically lost. Certainly under a different system the talent that may lay dormant till it die in the corps to which these duties are deputed in whatever manner to be performed, might be turned to far better account; but I have not stopped short with this aim. Could my wishes carry any fulfilment with them, they would be very earnest that the supply of all the soldier's wants should be deemed an essential and indispensable part of a soldier's duty; and if a better or a worse decision than is made in other countries shuts out from the hope of honour and distinction by far the greater proportion, if not all, of those to whom these duties are now allotted, a remedy reaching farther than the disease itself would be, to open the school

\* See Appendix.

instead of the preferment, and to train in the school of meeting these requirements, those who are destined to command and lead to victory the masses, of whose wants we have been treating, and whose work they ought to be; in other words, the point I seek to establish is this, that its constructive services are properly the duty of an army and an invaluable military school.

The CHAIRMAN: Gentlemen, Colonel Synge has not only offered to answer any questions that may be asked him, but he has invited a canvass of his opinions; and we shall be very glad to hear if any one objects to or offers any suggestions on that which he has brought forward. I hope we shall have the benefit of the opinions of experienced officers upon this subject, which is one well worthy of consideration. Colonel Synge has modestly laid claim to no originality, but he is the first to offer a solution of two of the great difficulties of the day with respect to the army, namely, the questions of marriage and of limited service. He has shown us in what manner these difficulties can be overcome with benefit both to the soldier and the state. His opinions are supported by the fact that the pickaxe as well the sword have been said to be the badge of the Romans' conquest. The greatest military power in the world employed their men upon what we call civil works in times of peace; and the consequence was, that they were sounder, hardier, and healthier men in time of war. The latter portion of the paper is so much connected with the Engineer service, that if there is any officer of the Royal Engineers present, I hope he will say a few words upon the opinions of a brother officer.

Sir HARRY VERNER, Bart., M.P.: I came here this evening hoping to hear the opinions of engineer officers who have had the same kind of experience that Colonel Synge has had. For I feel it to be of great importance to those who may advocate the employment of military labour, that, when the Army Estimates come on in the House of Commons, they may be able to say they have heard statements from those who have tried the system, that not only the employment of military labour will not interfere with military duty, but that it will render the army altogether more efficient. I entertain no doubt of that myself, and I hope to hear military men speak from their own experience to the great importance and value of so employing soldiers. One great object of the present day is to render the soldier as moral and as good a citizen as possible. I confess it is my ambition to see the day when the return of a soldier to his native village will be hailed by all the respectable inhabitants as an acquisition; when, instead of returning with something of the character that Colonel Synge has described, he shall return a much better member of society, coming to practice in his native village the trade he has learned in the army, and able to earn a respectable livelihood. In this way he will hold out an example to younger men that they cannot do better than enter the service; in short, holding out an example which the most respectable men in the village will be inclined to follow. I feel the great importance of this, for I heard it stated by a military man of great experience, a few days ago, that the men who are now coming into the army are less respectable than they were a number of years ago. It is owing to this, that almost all occupations are so highly paid now, that young men find they can do better for themselves than by going into the army. But if by entering the army, they are taught some trade, their opinions would be different; and I really think in this way a higher class of young men might be induced to go into the service. The gallant gentleman who has read the paper did not advert to the different occupations in which a soldier's labour might be employed. I recollect the last time I went over a French barracks, the officer who went round with me took up a soldier's shako and said, with the exception of the eagle on the shako, the whole of the soldier's dress is made in the barracks. Accordingly we went into one room, and there we found tailors at work; and in another, shoemakers; in others, all sorts of trades and occupations going on; and in the last which I entered, there were a number of Frenchmen dancing and pirouetting as hard as ever they could. They were jumping and performing all sorts of antics; I could not help thinking that I should like to see

our fellows doing the same thing. I then went to stay with an old friend of mine belonging to the French army, who had 40,000 men under his command. He said each thirteen men had a space given to them with poles and rafters, and they were allowed to cut their turf coverings for their huts, and to construct them as they pleased. Some of them built their huts upon two stories, and so they had rather more space for a garden; others built their huts on one story; and in almost all cases there were maps and sketches and all sorts of things done by the private soldiers, with which they had ornamented their huts. It evidently gave them a great deal of amusement, and a great deal of very useful occupation. With regard to the expense, I must mention what I quoted in the House of Commons. I think it was Major Buckley, the barrack-master at Chatham, who stated in his reply to the queries put by my honourable friend on my left, General Craufurd, that when he was in Jamaica, about thirty years ago, he built a target which had been constantly used ever since. That target was found to require some repair, and the repair of it alone was estimated at £200; whereas all that it cost him, and all that it cost the country, was three dollars in the construction. He employed the men under his command in the work. That shows how important it is to employ these soldiers in service of this sort. For my part, I believe the more they are employed the more popular the service will become, and the more efficient and the more respectable, and the greater the advantage which will accrue to the country at large.

Lord RANELAGH: I quite agree with the honourable gentleman who has just spoken, and I must say he has added one word that is the most important we have had to-night. That word is "trade." If we could introduce the system in practice in the French army, and make every man learn a trade, it would be a great benefit. But I cannot agree with what has fallen from the gallant lecturer, that there is the slightest chance of soldiers being employed on what he calls military works. I will ask him to illustrate more than he has done what he means by military works. I would put it to him in this way: What are those military works that he contemplates, and how are the men to set about them? I do not mean the mere digging of trenches, and throwing up earthworks for batteries. He goes beyond that. I would ask him how he would employ a regiment of Guards, and how he would employ a regiment of the line quartered, say, at Portsmouth?

Major LEAHY, R.E.: I rise with very great deference to observe that the question has not escaped the attention of the authorities. At the present moment, there are extensive military works being carried on exclusively by military labour. I allude to the new fortifications; they are being carried on under circumstances which when the proper time arrives, will enable the country to determine the value of that kind of labour. Under the suggestion of Sir John Burgoyne, with the approval of the Secretary of State for War, and with the encouragement of the Commander-in-Chief, some of the military works at Dover and at Portland, are being carried on exclusively by military labour at the present time. A large work of the estimated value of £80,000 was commenced by contract labour. Circumstances arose which rendered it necessary to terminate that contract; the whole of the plant was taken over, and the department set to work on their own account. At the present time there are two companies of Engineers and a company of the line employed in carrying out about three-fourths of this work; and—I cannot speak exactly to the figures—a very large saving is being effected in consequence. In a similar manner, at another station, a company of Engineers, assisted by the Royal Artillery, and by the Line, have been employed carrying into completion a work which was commenced by civil labour. An exact record is kept, and it shows that a considerable saving has been effected, owing to the fact that military labour is paid at a less rate than civil labour. I have no doubt these facts will be brought under notice at the proper time; but I mention them now, in order that the meeting may not suppose that the question has escaped attention.

Major EWART, R.E.: It is well that an explanation should be made with regard to what has fallen from Sir Harry Verney, and relative to the comparisons which have been drawn, and which are constantly being drawn between the French service and our service, in respect to the question under consideration to-night. It must be recollected that the French service is dependent upon conscription; the consequence is,

that you get into the service a very different class of men from what you do in this country. In this country we have to go into the labour market, and to raise our men by money. It is a matter of pounds, shillings, and pence. In France they draw men of all classes, and they accordingly get into the ranks carpenters, tailors, bricklayers, shoemakers, and tradesmen who have been apprenticed before they come into the service. The great difficulty with us is to induce men of this class to come into the ranks. Taking an ordinary regiment, you find a very small proportion of what you call tradesmen. In recruiting for the Engineers, although we get a certain proportion of steady tradesmen, yet we get a large proportion of unsteady tradesmen. That is another difficulty we have to contend with in our service. If you employ men upon military works, you may have men who are very good carpenters and very good bricklayers, but you find many of them are drunkards, and you are obliged to send them back to their ordinary duty—you cannot continue to employ them. These are circumstances that ought not to be lost sight of in comparing our service with the French. The question of the great expense of the English soldier compared with the expense of the French soldier was under discussion in the House of Commons the other night. All that is dependent upon this consideration, that you find in the French service tradesmen of all kinds who may be employed at a very small remuneration. That cannot be done in our service, for the reasons I have stated. With regard to the subject of extending military superintendence, which has been mentioned to-night, I think the system in the French service of *corps-de-génie* answers extremely well, and I know no reason why it may not be extended in our service. Within the last two or three years we have introduced a class of military foremen, taken from the non-commissioned officers of the Royal Engineers, who are doing the work which is done in France by the *corps-de-génie*, and are doing it very well. In the French service they are substituted for civil clerks of works. A material improvement is going on in our army, as is shown by the works now being carried on. I may mention my own experience. I have had experience in the employment of troops in the colonies, in the camp, and in the field; and I have carried on the whole repairs of a camp in this country by military labour.

The CHAIRMAN: I don't know whether Colonel Synge adverted to the quality of the soldier with respect to saving. I think if the savings bank returns were referred to, it would be seen that our soldiers upon the very limited amount of pay which they receive are generally speaking more a saving class than the artisan who is in the receipt of very high wages. It is proved by the Savings Bank returns that our soldiers actually do lay by more money in proportion to their limited pay, than the artisan does out of his highly paid labour. As the advantage of industrial employment has been adverted to, I am induced to say from my own experience that it produces a very beneficial effect. My own experience is on a small scale, being limited to the staff of a militia regiment. The men are all employed, and they are all the happier for being so. There are a number of useful trades carried on in the regiment, to such an extent that the whole of my clothing store has been filled up by my own men. The consequence is, that what was estimated at a very high rate has been done at a very small one; and the men, who would otherwise have been in the neighbouring public-houses with nothing to do, are as happy as if they were all in one family. There is not only something to give them constant occupation, but there is something to take pride in; they take a pride in all these works, as much as if they really belonged to themselves. The trade of book-binding is one that has created so much interest, when some novelty happens to be introduced, such as a photograph book of a new description, that I have really had a greater demand upon my men in the book-binding department than they could comply with. This, I think, proves that we shall meet with success if we give encouragement to industrial occupations.

Lord RANELAGH: That is not military labour.

The CHAIRMAN: That is quite true. Colonel Synge will now be kind enough to answer your objections.

Colonel SYNGE: May I ask if any gentleman will speak upon the financial aspect of the question. Some elements of that kind have not been noticed, and there are gentlemen present perfectly competent to speak on matters of finance.

**Sir Harry VERNET:** I may take the liberty of stating for the information of gentlemen, that only two days ago I waited upon the Secretary of State for War, in order to arrange with him a Return to be moved for in the House of Commons, to obtain the very information which has been referred to; namely, the number of men who had learned trades previous to enlisting, and the number who have been employed in their trades since they have enlisted.

**Lieutenant-General CRAUFORD:** I think there can be no question that the employment of soldiers of the line on military works is perfectly feasible, and not open to any objection whatever. I was stationed at Dover for a considerable period. One of the regiments of the line was employed in works of construction there, and I heard from the officer commanding them that they were men from the mining districts, and that they made themselves particularly useful. With regard to the proposal of Colonel Synge, that the men should be encouraged to marry, I must say that I differ from him with respect to that. I do not think it would be desirable to increase the number of married men in the army. Still, I have no doubt when a man makes a good marriage, it improves his character very much. We shall never have in the English army men already instructed in trades; but we may induce young men, who aspire to improve their circumstances, to enlist into the army in the hope of being instructed in a trade after they have enlisted, so that they may be able to get their livelihood by it after their term of service has expired. They will return to their communities with their characters raised, possessed of the means of earning a respectable livelihood, and they will thus be objects of congratulation to the communities from which they have sprung. If very young men enlist, the term of ten years will be a time of probation to them; they may be instructed in trade and may save money; and when they return to civil life they will still be young men, and can marry then, with much greater advantage to themselves than if they were to marry while in the army. For my part, I should be sorry to look to the promotion of military works by the soldier, with the view to increase the number of married men in the army.

**Major EWART:** I am afraid the difficulty we find now in one respect will be increased. If they are taught these trades, the difficulty will be to get the men to renew their enlistment. It is clear we shall want to hold out greater inducements to get them to remain.

**Major LEAHY:** It may be interesting to observe that in the Belgian army the soldiers are enlisted for two years only. A large section of the works at Antwerp have, however, been carried on by military labourers; and those military labourers have not enlisted as trained artificers. They have not only been employed on the works, but during the winter season they have been taught trades which in the summer season they have carried out in practice. So that in our service, with the encouragement which the employment of military labour now receives from the authorities, I apprehend there will be no difficulty in extending the system much more than has hitherto been the case. As a means of carrying it out, I quite concur with Colonel Synge, that military superintendence is essential to the employment of military men.

**Colonel SYNGE:** I have been unexpectedly gratified with the discussion. There are several points that have not been discussed that I wish just briefly to recall to your attention, because I am disappointed at their not gaining more attention. One is the financial aspect of the question; and the other, that which has been so forcibly pointed out with reference to marriage. With regard to the financial question, what I want to impress upon you is this, that by the course which I propose, we can relieve the Quartermaster-General's department of many of the financial difficulties which arise, I believe, in consequence of the present system of carrying out military works. Upon the question of marriage, I may shortly say that for many years I had been convinced of the soundness of my views in every other respect: but I never ventured to bring them forward, nor did I ever see the completion of them, until a casual remark was made to me with respect to the question of marriage. I must say that up to that time my own prejudices, my own views of the matter, were completely against marriage. I found everything else clear; but then the question arose, "What is the man to do with his money?" and I thought



it would only increase existing evils. I went into the subject in conjunction with those deeply interested in the improvement of the married soldier's position, and in all the circumstances connected with it; and it then appeared to me that a wider permission to enter upon marriage offered a complete solution of the difficulty. I may say, it is the keystone of the arch. Another point necessary for the complete cohesion of all these several parts in practice, is the training of the officers. What can illustrate the usefulness of training, through the execution of the works which you require for the army at all times, for a body prepared for service in the field, more strongly than the absolute necessity for there being such a body? How are you to train it better, and at less direct cost, than in the constant and complete provision of the wants of the army? What can show more strongly the incompleteness of the present system than the fact, that a vast proportion of the body now so trained is not available for military service? What I particularly want to bring forward is, that constructive duties ought to be the training school of those who are the fighting men. That this is consistent in principle, and cheap in practice. The noble lord near me has asked, What are the works which you wish to put them upon, and how is the work to be done? I maintain that everything that is required by an army, whether for its maintenance or for its duties, is a military work, and should be attained and carried out by the men who fight. The soldier may be likened to something like a snail; he should carry his house about on his back. Under his great coat he carries his knapsack, and in that knapsack is everything he wants. Now, as far as possible, I would have each man comprise within himself the ability to supply all his wants, and to perform all his duties, so that if you took the individual soldier, a unit as he stands, you should not only have a man who is to be shot at, but rather one who is superior to others, and able himself to supply all he wants as he goes along. Then you have a real soldier. And I believe ten such soldiers would be worth twenty that could not. That is my opinion of a soldier. It has been said that victory hangs on the side of large battalions. I say, rather, that victory attends *strong* battalions; efficiency, and not *mere* number. So that I mean by military works, everything a soldier wants, everything that is rendered necessary by his business; all this should be met by one who is a soldier. The subject hangs together. If you want to have efficient men who can meet all that you require of a fighting man, train them and employ them in the daily meeting of these requirements, whether in time of peace or in time of war, and you will have it: and do not go to an enormous expenditure for extraneous things, when a system of simplicity will meet it all. The War-Office expenses have increased 33 per cent. in two years, probably in a measure owing to the Indian amalgamation; but it is a very large expenditure, equal, as I have stated, in clerks alone, to 42 companies (4 battalions) of fighting men. I hold in my hand a letter, which I received from a person well-qualified to speak upon what he writes about, who adds his testimony to what has already been justified by other speakers, that where non-commissioned officers superintend the works, and soldiers execute the works, the result to the country is very favourable, and causes a large saving, and he sums up the whole matter in this way:—"There is no doubt that our army might be profitably employed in many ways with great advantage to the country." I have letters also from officers who have been employed in this manner almost on active service, to the effect that they have performed works in Canada at one-fifth the expense that they would otherwise have cost. I have known of cases where the saving on an annual sum amounted to one-half. As for increasing the proportion of married men, I do not think it will have that effect in the existing numbers. My proposal includes an increase of the combatant force equal to the number wanted for military works; and though I wish to increase the privilege of marriage very largely, yet to give an opportunity to a man to marry at his own expense, is a very different thing from throwing all the expenses on the Quartermaster-General's department. I concur in the difficulty that has been brought forward with regard to trades. I did not speak of trade being an advantage to soldiers as civilians; it is not my view to bring a man into the army, and teach him a trade, that he might then go out of the army again. That was not my view. Probably the House of Commons would veto a proposal for money to teach men a trade to be carried on in civil life; but my point is this, that by the present system

we are positively prohibiting men from the performance of their proper duties in their own business. A remark has been made on the difference between the French and English armies. But it does not apply exactly to the subject in hand. I have not referred to the French army, because comparison with the French army would not apply; but I know another instance, that rather corroborates the statement that has been made with reference to the works at Antwerp. I have known, not soldiers, but I have seen some two thousand and odd boys and men brought into prison at the time the system which drove men mad, of solitary and waste labour, was in competition with the natural way of dealing with that question, namely putting men to work. This latter course was then attended with a great deal of difficulty. There was a great deal of difficulty, in a case in which I know the facts myself, in contending with the prison authorities who were entirely against employment on works. But there was an arrangement made that gave a man a little more to eat. They were not at that time fed up to the masthead and made riotous, as they have been since. They were really well nigh starved, and these men were induced by the stimulus of a little more food to apply their latent skill. The late Lord Raglan was at the time about to go to the Crimea; and Sir James Graham performed in his place a tour of inspection. He was struck by the excellence of the work performed, after a very short time of training, by men and boys who a little while before had been Irish pickpockets, or criminals of a still lower grade. The old work had been justly considered model work as performed by contract, but that done by the convicts was as good. These were not soldiers who were taught to do the work; they were simply Irish pickpockets, whom the convict authorities of the day, moreover, drafted off to other places as fast as they could. That shows strongly that a soldier could do far less difficult work to great advantage, if he had a chance, although, happily, no conscription gives us a compulsory admixture of skilled men in our army. The substance of what I contend for is, that there are certain things which a soldier needs, which are not now put upon himself to meet, and that they ought to be imposed upon him; and that doing so would benefit the soldier, the officer, and the country, and in every possible aspect would be a benefit. The whole coheres; turn it in what way you may, it presents some advantageous feature, whilst the proposal is as simple as can be.

The CHAIRMAN: I am sure I shall be only expressing the opinion of the meeting if I convey your thanks to Colonel Syngo for the interesting lecture we have heard. We are the more indebted to him, because the lecture has given rise to a very interesting discussion; and I think we ought to include in our thanks those gentlemen who have kindly taken part in the debate.

## APPENDIX A.

Such, accordingly, appears to be the principle of the existing organisation. In the regulations furnished for the guidance of the corps in the performance of the duties allotted to them, it is laid down that "the direction, control, and responsibility is in the commanding engineer," and he is enjoined so to carry on the duty that "the whole distribution and detail of the execution of every service is to be conducted" under his own direction, with the direct object (which is expressly stated to be that of every regulation in the routine and detail of duty) "that the junior officers may have every opportunity of being fully instructed so that they may become competent to discharge the important duties of commanding engineer when that situation shall devolve upon them."

It is added that observance of the rules laid down will ensure that the younger officers become "conversant with every part of the service in which they are employed, from the formation of the design and estimate to the final completion and measurement."

So far there is no mention of nor reference to civil assistants. They are named for the first time in immediate connection with the particular duties of the junior officers, and consist of clerks and foremen of works and of clerks. More recently the foremen of works have been amalgamated with the clerks of works, so that whenever mention of them occurs, the present reading would be a senior and junior clerk of works.

The position and duties of, and the qualifications which these civil assistants are required to possess, are severally defined as follows:

Clerks of works have, "*next to the engineer officers*," "the control of the execution of all works and repairs," "and *in the absence* of officers at a station, become responsible for the due execution of all works."

All measurements of work, and all receipts of material, are to be attended by an officer of engineers, a clerk, and foreman of works. The two former are required to keep their respective measuring books, in which each is to make his separate computations.

This summary, taken from the official rules, shows the office of clerk of works to be subordinate and supplemental to that of the combatant officer of Royal Engineers, to be held by one intended to act in the dearth of officers, competent to perform minor but still responsible duties requiring technical attainments, and to have been resorted to as an agency less costly and more easily to be procured than the military officer of higher and more special attainments.

The organised system is, moreover, evidently intended to afford a reciprocal check throughout the whole working and detail. This is, no doubt, a sound and practical principle, but it is of no value unless it be applied in practice; nor does it appear necessary to resort to a complex or a civil agency in order to attain its adoption. Matters militarily organised are invariably checked, but it is by a board of officers, by the association together in specified duties of different ranks, or of different corps, or of different branches of the service. Civil agency is not necessary to this end.

In practice, however, the check is usually wanting. The officer of Engineers is often "absent at the station," that is, is not available in sufficient numbers to perform his allotted share in the system of regulated check, so that, be the result ever so innocuous, the clerk of works is generally unchecked. The *employé* actually made use of is the one who, of the two, is at the least the more open to the force of any temptation that may exist. This may be wholly unattended with evil; but if it be, it forcibly determines that the extent of the intended check is not necessary as well as not attained.

The qualifications prescribed for a clerk of works are "the strictest integrity, activity, and attention, and a full acquaintance with designing, building, artificer's work, and the qualities of building materials of every description. He should be competent to draw with neatness and accuracy plans, sections, and elevations, and be qualified to give

detailed working plans for the different parts of a building; he must understand thoroughly how to estimate and measure work of all kinds, be acquainted with book-keeping, and write a good hand."

These qualifications form, to the extent at which they aim, good and varied acquirements. If united in a high degree, they form valuable professional attainments; but this summary, which may be taken as the standard or ideal of a clerk of works, does not contain anything at variance with military service. Integrity, activity, and attention are necessary to the performance of all duty, but they are emphatically military qualities, and they are to be found as conspicuously in the higher ranks of non-commissioned officers of Royal Engineers as anywhere else. Full acquaintance with designing ought to be the necessary qualification of an officer of Engineers, and forms, as has been seen, the whole or main object of his training in the routine of professional duty. So also with regard to the principles and practice of building, and a general acquaintance with the qualities of building materials and the higher descriptions of drawing. That full knowledge of the minute details of building, and of artificers' work, and that intimate acquaintance with the various materials employed, which are essential to the perfect execution of work, can never, as a rule, be so thoroughly concentrated in any one class as they will be separately possessed by master tradesmen in the several branches that enter into the requirements of military service, and the position of a master tradesman of very high qualifications is entirely consistent with that of a non-commissioned officer of the higher grades.

Clerks, according to the regulations, are to be between twenty and forty years of age, to possess respectability of character, to write clearly, legibly, and quickly, with correct spelling and grammar, and to have a perfect knowledge of the first four rules of arithmetic, of Reduction, and the Rule of Three, of Vulgar and Decimal Fractions, and of Duodecimals. As to office work, they are to assist the clerks of works, whose time is to be rendered as available as possible for outdoor duty.

The correspondence of a large office, if that correspondence be necessarily large, or if the duties be confidential or important, ought to be under the charge of an officer; but if it consist only of the minor duties of clerks, or of what the Regulations term "mere office work," these duties clearly fall within the capacity of many non-commissioned officers, or even of men in the ranks.

So far as this civil element may have been resorted to from motives of economy, it can scarcely be said to have been eminently successful. Its cost is by no means insignificant. By reference to the army estimates 1864-5, it appears that there are 19 clerks of works, 83 clerks, 90 temporary foremen of works, &c., representing, with the various allowances, altogether an expenditure of about £74,183, besides rations equivalent to those of upwards of 100 men. An expenditure as nearly as possible three-fourths the amount voted for the whole existing companies of Royal Engineers, and which, with the additional sum of £3,394, expenses in the office of the Director of Works for surveyors, draftsmen, and clerks, amounts to upwards of 8 per cent. on the whole

votes for works and buildings for subsidiary and subordinate assistance, exclusive moreover of the proportion of the £125,055 for clerks in the War Office that may be employed on duties arising from the same votes, which amount for clerks only in the War Office is some £15,000 a year more than the cost of the 40 companies of engineers, and exactly one-sixth the entire expense for works and buildings of the whole imperial service at home and abroad.

Thus the regular employment of the officer of engineers, though carried on in all parts of the empire, brings him, unless he be attached to the little body of soldiers incorporated under the same name, everywhere alike into a round of duties, in the conduct of which he is associated with civil assistants, civil contractors, and civil labourers, in short, exclusively with civil life. He forms the sole, and he is often deemed the anomalous military, element of the life that surrounds him. Even if taste, liking, and zeal could in every instance rise superior to life-long habit, rule and circumstance, still it is obvious that the officer of engineers is in general placed at a disadvantage as impolitic as unfair as to the acquirement or practice of military aptitude and habit.

Impolitic, *because his military service is the essential object of his professional attainments.* He is liable to be summoned at any moment to duties that a soldier, animated by a soldier's spirit, only can perform. He may suddenly be called to be concerned in, or perhaps to conduct, the operations on which the safety of a fortress, the success of an expedition, or of a siege may wholly or in part depend. Unjust, because he is debarred from the attainment and practice of those qualifications that would enlarge his capacity for service, and from cultivating that aptitude and taste which most probably led him to enter upon a military life. The fulfilment of such aspirations he must, under present conditions, in general for ever forego.

In practice the extensive employment of civil agency is, however, productive of an injury more serious than any merely personal hardship or injustice.

The primary aim of the whole detail of the routine of duty is declared to be the training of the officer of engineers so that he shall, through personal and experimental conversancy with every branch of that detail, become perfectly fitted for the post of commanding engineer by the time he shall attain that position. Very frequently the junior officer is not under this immediate guidance and supervision by his commanding or senior officer, but is often called upon to furnish, as best he may, designs, plans and estimates for various services, and is ostensibly required to employ a degree of knowledge which his limited experience renders it, in fact, impossible he should possess; whilst, at the same time, the actual definition and subdivision of duties, laid down by authority, often puts it out of the power of his commanding officer to interfere at all with these duties in the course of their preparation, after he may have furnished his general instructions, until they are submitted to him in a state of comparative or absolute completion.\* The commanding officer can then only transmit

\* This is almost invariably the case at outpost stations where there is generally a very young officer, but an experienced clerk of works.

the documents he receives to the higher authority over himself, or return them, if absolutely necessary, for amendment to the junior officer, and so inevitably delay the service he is expected to forward; and, in fact, the junior officer has both been expected, and by circumstances forced, to appeal for professional direction or help not to his senior or commanding officer, but to his subordinate, the clerk of works, from whom, unless the strength of his own character have prevented it, he is more likely to have taken guidance also, than to have received assistance only. The work approved by the commanding engineer, that is to say, which has thus passed through his hands, undergoes a farther scrutiny under a superior authority, but by a civil revision as to the minutiae of detail. In its lower stages this course is contrary to all military subordination, and at variance with the proper relations between the officer and the clerk of works. It can act favourably on neither one nor the other. Its practical effect also, is that the officer of engineers only has the opportunity of fully dealing with the whole details of his professional duty in all their minutiae at a time when his experience and his youth are calculated to interfere, the one with the ability, and the other with the inclination of doing so with good effect and in good earnest. Throughout, that thorough conversancy and complete responsibility that might be otherwise obtained are frustrated. Whether the general qualifications of the clerk of works be good or bad, his technical attainments, if he have any experience, must necessarily be greater than those at first possessed by the young officer. Besides, if he be young or indolent, or conscious of deficiency, he may fall back with but slight risk of detection upon the technical knowledge of, and on the practical examination of the work wanted by the foremen of the very contractors to be employed in the eventual execution of the service under consideration. In point of fact, clerks of works do receive after their entrance into the service that very training at the hand and under the immediate supervision of their seniors, which the Regulations so pointedly prescribe for the officer of engineers. If exceptions take place to the course that has been described, it is owing to officers of Engineers taking upon themselves the duties of detail belonging to the clerk of works; but so contrary is the practice actually pursued to the official theory of the code of Regulations, that his doing so would not only not be sanctioned, but would under ordinary circumstances necessarily expose him to the censure of his superiors. Thus if the foregoing statements be accurate and admitted, the numerically strong, complex and very costly civil agency employed is not essentially necessary;—is needlessly expensive, and is calculated to frustrate rather than to foster that which is declared to be the aim and basis of the method of the entire prescribed system of duty; and if training for his future position in the manner therein laid down deserve the weight clearly attached to it by the Regulations, it were too sanguine to expect that its frequent complete negation in practice can have had no injurious effect in the instance of every officer who has risen to the position of commanding engineer without it. At the best, let them have remedied the consequences as they may, officers so circumstanced

have undoubtedly not had the advantages to which they were entitled and which the orders prescribed.

## APPENDIX B.

The divergence between theory and practice in respect to the training of the younger officers of Engineers has been pointed out. So far as the object theoretically proposed can be met by any instrumentality it would be fulfilled by a military system. Were the minor divisions of Engineer commands abolished, and the current and special services as they arose allotted under the immediate orders of the Commanding Engineer, not only would a greater and direct responsibility be obtained, but the preparation of plans and estimates might readily be devolved on the junior officers under his immediate direction as laid down by the code of regulations; and, by entirely withdrawing clerks of works from the duties and offices of the younger officers, these would have only the legitimate assistance of approved non-commissioned officers, masters of trades.

During the continuance of the existing clerks of works, *whom it is proposed to promote in the same manner as now to the highest situations at present open to them*, they might with great advantage be attached to the offices of the Commanding Engineers charged with the duty of examining all the minutiae of the details of services prepared by junior officers or by non-commissioned officers upon the instructions that had been given direct by the Commanding Engineer or his assisting officers. The younger officers would by this means necessarily become conversant with every branch of their duty, and that under the immediate direction and observation of their superior officers. Their qualifications and improvement would be daily tested, yet without needlessly encumbering the commanding officer with a burden of detail. As vacancies occurred in the establishment of clerks of works these duties should be performed by one or more officers of medium rank assisted by perfectly trained non-commissioned officers. The direct benefits to the service would be scarcely less considerable than those to the training of the younger officers. The services required might be performed more directly and with less back reference. *Waste labour*, which in *physical* matters is deemed the most severe of punishments, if not the most ingenious and cruel of tortures, would be greatly lessened. The multiplication of plans and documents, the copying and registering of correspondence and orders, rendered necessary by sub-divisional arrangements of duty, often at the same station, would be diminished, if not wholly abolished. By farther substituting for regulations which require the correspondence to be kept in books of "letters received" and "letters issued," a classification of correspondence according to station and subject, this simplifying may be much extended, and the information relating to any station or subject ascertained by simple perusal, instead of having to be "hunted up" by means of hieroglyphics referring through a multitude of ponderous volumes and perhaps

ingeniously elaborated to necessitate dependence on personal knowledge and individual inclination.

Similarly, by requiring perfect models or plans of every particular, and all information, properly classified and perfectly distinct, to be at *the actual working head-quarters* of every station, and nowhere else, it would always be known whence to obtain any information that might be required, and always practicable to obtain it without delay, and yet without multiform waste reproduction of the same matter.

This simplifying, and that is but another name for the combination of order, efficiency, and economy, might be usefully extended by consolidating the votes for the military constructive service, and abolishing the arbitrary distinctions of "fortifications," "barracks," and "store and other buildings," which compel a multiplication of the forms of estimate with all the accompanying papers, and which end only in obscuring the real military resources, requirements, and expenditure of any one post, and in making it next to impossible to collect them and view them in their merits as a whole. Another practical improvement over a system often detrimental in practice might be gained by voting services absolutely, instead of conditionally on termination within the arbitrary period called "the financial year," whereby the gist of the whole matter, the actual execution of the work wanted, is often thrown into the most unsuitable season of the year, and contracted for and carried out under conditions unnecessarily disadvantageous, causing moreover needless and often perplexing labour in other words, useless expenses in supervision as well as in the contracts, for the time of its paid servants is the money of the State. It would be quite compatible with this proposal to limit the expenditure within the year as might be deemed requisite by considerations of finance. The evil arises from the practical work being subordinated to what may be likened to the convenience of the clerks taking stock, not from the fact of stock-taking.

In many respects the bases of military requirements are in a great measure constant; where this is the case at least the general arrangements may be grounded in common upon these requirements. For instance, the strength of a regiment of cavalry or infantry, or that of a battery of artillery, or of a company of Royal Engineers being determined, as well as the various items of accommodation that have to be provided in addition to the barrack room, such as shops, chapel, school, library, and recreation rooms, gymnasium, canteen, and the like, and the proportion of officers and staff, non-commissioned officers, and of married soldiers' quarters, the general arrangement and construction of a barrack should in each case be uniformly based on these constant requirements, which ought to be clearly defined in one consolidated regulation. Such a construction must be worked, as it were, outwards and upwards, not pressed by an arbitrary necessity, such as too small a space of ground, or the vote of but one-half the necessary money into conditions not to be reconciled. For example, the barrack-room ought to be determined not from an outward dimension, but by addition of its contents, from the dimension of the barrack bedstead, the space to be left between them, the air



to be breathed per man, the nature of the stove or fire-place, the best position for the arms, for shelves and accoutrement pins, the number of men it may be deemed on the whole most judicious to place in one room, and the effect of the position of door and windows on these particulars. The detail of the several buildings having been deduced from similar considerations, their relative position one to another, and to the parade, the drill or exercising ground has next to be determined.

It is obviously unnecessary to employ a numerous and expensive staff in repeatedly meeting these wants from limited experience and confined resources. Indeed many of the elements are necessarily arbitrarily fixed, and can only be determined by the highest authority. Under the existing system, the result of all experience must be concentrated at the War Office, and should long ago have caused the ideals of all such services to be, so to speak, stereotypes to be only so far modified, as might be necessary or beneficial from local causes. These modifications arising from intimate local knowledge, would be the proper subjects of scrutiny by higher authority, both as to conception and proposed execution; but it should be unmistakably open to all commanding officers to bring to the notice of the superior authorities any suggestion they might deem an improvement deserving such consideration.

It is obvious, that from the aggregate of such designs as have been described, any one or more of the several parts that might be separately required, might be readily adopted; that is to say, precisely the same principles are applicable to the component parts of a barrack, and to all frequently repeated services grounded upon constant requirements.

Annexed are forms for the employment of military labour. They give a complete diary and check-book without any repetition of the services performed or of the nominal roll in the daily distribution. They comprise fully everything that can be required, and by the "Abstract" in the "Diary of Services in Execution," become the basis of a record or expense ledger, made by simple extract, which would show the expenditure for any given time on every building, or particular part or class of buildings, or on any special service, or on any post, station or establishment. They have been framed to meet the most intricate case (so far as mere book-keeping is concerned), that of maintenance by minor repairs executed on requisitions generally containing many items and often occupying only part of a day in execution. The same forms answer for all other cases, but fewer entries are necessary and fewer distinguishing marks among the entries.

Form I. The "Diary of Services in Execution," shows the service required in column I, specifying in its subdivisions A, B, and C, the locality or name of the work or building, the description of the construction or repair required, and the date of the service ordered.

Column II gives the item and vote or estimate to which the service is chargeable:

FORM 1.—Diary of

Date of Execution.		Requisition or Authority.		SERVICES.			Chargable to	DETAIL as EXECUTED by		
From	To	No. of Requisition.	Item on Requisition.	Locality or Name of Work or Building	Description of Construction or Repair required.	Date when ordered.		Materials.		
						Veto or Estimate.	Item of ditto.	Nature, Description, and Quantity.		Cost.
										£ s d
V		III		A	B	C	II	a	A	b

Services in Execution.

th Company Royal Engineers. or th Company th Regiment.																			ABSTRACT.		
Names or Referen- ces by whom executed.	Labour.					Total of Materials and Labour.			Cost per Detail at Contract Prices.			Difference.			Remarks.	Work, Service, or Building.	Amount.				
	No. of Men.	Rates of Pay.																			
						£	s.	d.	£	s.	d.	£	s.	d.			£	s.	d.		

Column III, the requisition and its item in cases that the service is one performed on requisition.

These columns should be filled in immediately on the receipt of any order for the execution of a service; and are merely clerks work requiring no technical knowledge.

Column IV shows by its various subdivisions A, a b, B, C, c d, and D the materials consumed in the execution of the service and their cost, by whom each part has been executed, and the cost of the labour expended at the regulated rates of pay, as well as the total cost of both material and labour. With exception of this last subdivision, which is merely the addition of other two, this column, as well as columns V, VI, and VIII, must be filled in by those entrusted with the superintendence and execution of the works.

Column V gives the date from the beginning to the end of the execution of a service.

Column VI, its cost as estimated at contract rates by civil labour.

Column VII, the difference above or below that estimate, of the actual execution of the work by military labour.

Column VIII is for remarks.

Column IX (A B) gives an abstract of all work done and of its cost, from which a perfectly accurate record may be kept (without any further trouble than that of noting it) of the expense incurred according to any classification that may at any time be wanted, however arbitrary; such as commanding officers, field officers, and officers, quarters, men's or married soldiers quarters, chapel, schools, libraries, recreation rooms, canteens, or gymnasia, walls, brickwork, masonry or wood, of boundaries or of buildings; roofs, slate, felt, or iron; stoves, grates, drains, roads, fences or what not, almost without end. One form and one entry contains the whole; nor is any other precaution necessary to its use than to avoid crowding the entries in column I in order that sufficient space may be left for the parts under A and B of column IV.

Form II. The "Weekly Check Book and Diary of Daily Distribution," the former framed to meet the regulation by which military working pay lists are made out weekly, and, with the latter, showing where and on what services each man is employed each day.

Column I gives the nominal roll, and after the entry of the non-commissioned officers, should be arranged by trades. Its subdivisions give the names, trades, rank, and regimental number of each man.

Column II enumerates the services in progress during the week, to each of which is given in the subdivision B of that column a distinguishing number or mark, which used in the appropriate part of the column (III) of the days of the week, shows the service on which the man was employed opposite to whose name it is placed on the day under which it appears. When a man has been employed only for part of a day, the fractional part placed under the distinguishing mark denotes the proportion of the day for which he has been employed on the service, which is indicated by the distinguishing mark or number. When he has been on more than one service in a day, the several distinguishing marks, with the proper proportion under each, will show

his whole employment for the day. Subdivision C of this column shows to what item and estimate each service is to be charged.

Column III contains the days of the week to be filled in as described in treating of column II. It also contains under each day of the week a subdivision for the initials of the superintendents. This initial, if unaccompanied by remark, inserted in the column for that purpose, is the certificate of him whose initial it is, that he is satisfied both with the quantity and the quality of the work performed by all those under his charge and devolves the responsibility to that effect upon him. By this simple method a certificate and report are daily obtained extending from the non-commissioned officer in charge of a squad or of any detached piece of work, or of any particular branch of work, through the several master tradesmen up to the officers in charge of works, involving a direct acknowledgment of personal responsibility throughout every portion of the work.

Column IV is abstracted at the end of the week, and shows the amount to which each man has become entitled, according to the days he has been employed and the rate at which he is to be paid per day.

It is obvious that task-work can be registered by the same means, showing in days, the value of the work performed.

Column V is for remarks by the different grades of superintendents as may prove necessary.

Column VI is for the amounts and items to which the whole expenditure of the week has been chargeable, showing the amount per item and per man. It must contain as many subdivisions as there are separate items of expenditure in actual progress during the week. This can be sufficiently foreseen to prevent, by an ample allowance, the necessity for any frequent repetition of the heading. Under each subdivision is brought out opposite to each man's name the proportion of his earnings as it is chargeable according to the heading of the subdivisions.

Column VII gives the account authorised for each service, and the mark of reference to the authority.

Column VIII is for the amounts expended on each service, both during the week, and total up to date.

Columns IV, VI, VII and VIII, are clerks' work. The entries on the lines in columns II, VII, and VIII, must correspond with one another, and those in columns I, III, IV, and VI; but the entries in the two sets of columns are quite independent of each other as to the space they occupy.

## Form II.—Weekly Check Book and

# Diary of Daily Distribution.

SERVICES in PROGRESS.			AMOUNTS and ITEMS to which the employment of each man is chargeable during the week.												Authority quoting the reference of the authority and the amount authorised.	Amount expended																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Distinguishing Mark or Number to be used in the Column of Days employed.	Description (sufficient for Identification.)	Chargeable to.	Vote.			A. E. 18 %. It.			A. E. 18 %. It.			A. E. 18 %. It.				During the Week.			Total up to Date.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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The advantages of these forms are the completeness and succinctness with which every particle of information connected with the execution of a service is entered and recorded without any repetition of writing, the consequent saving of time and of money in useless office expenditure, the complete chain of report and responsibility obtained in like manner, whilst all the information connected with the execution of every service is minutely recorded, ready and plain at a glance whenever it may be required for reference. The daily distribution for instance may be ready with the first morning parade, the distribution as appointed being entered in pencil and filled in with ink according to the actual event of the day, on the return from work.

The arrangements for the next day are also made at that time; the several officers, or non-commissioned officers in charge of works, or parties attending for that purpose at the engineer office, and receiving from the directing officer instructions already prepared according to the orders received during the day, as well as orders of delivery from the store charge for any material that will be required for the services in hand or to be done.

These delivery orders retained by the issuer become his vouchers to the commanding officer for the material thereon specified.

The receipt, custody, and issue of materials may be reduced to a very simple routine. The requirements of new or special services can occasion no difficulty. The materials required for these, necessarily appear in the estimates on which they are sanctioned, and have only to be ordered, received, and taken on charge before the work is ordered to be executed; those for minor services can be provided for without any delay by an order on the contractor for the probable consumption for a month, taking into consideration the stock that may be on hand.

By this means both delay in the execution of a service and too great, troublesome, or responsible a store charge are alike avoided. The receipts of material would be so regular and comparatively infrequent that all material so received could be strictly measured and examined as to quality by the properly appointed officers according to the intention of the present regulations, now often, as has been stated, neglected or impossible in practice.

The custody of materials is provided for, by the appointment of an officer or non-commissioned officer according to the extent of the charge.

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