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THE ORGANISATION OF POWER TRACTION ON ROADS FOR NATIONAL DEFENCE.

By Colonel Right Hon. Sir J. H. A. MACDONALD, K.C.B.,
(Hon. Colonel, Army Motor Reserve).

Monday, 11th February, 1907, at 3 p.m.

Colonel Sir REGINALD HENNELL, D.S.O. (Lieutenant of the Yeomen of
the Guard), in the Chair,
in the absence of Lord MONTAGU OF BEAULIEU.

TWO months ago the Secretary of State for War, speaking in public, said:—

“I am an optimist as to what the people of this country would be willing to do for their country in a national emergency.”

These words, all will agree, are such as would be uttered by every good citizen. The willingness is an unquestionable national asset. There are few men in this land who would not make any sacrifice of person or purse if a direct attack was made upon the country. Still, they are only words—no doubt well meant words—but which will delude and snare the ignorant if they are believed to be spoken from the mouthpiece of a War Office, which is efficient as an organisation, and has provided already the quota of trained men and up-to-date *matériel* of war to give the national patriotism a common-sense expression in fact. Is there anyone inside or outside of the War Office who finds himself for a moment prepared to believe that if an attack upon our shores was imminent, Mr. Haldane's Department would be ready—ready in men, in arms, in ammunition, in transport, and in organisation—for movement, either by rail or road, to meet an enemy? If anyone were to tell us that all was right we should be inclined to accept his *archi-prêt* assurance in the light of the events of 1870, when a glowing report was given to the unfortunate Emperor of the French, encouraging him to plunge into war on the footing that all was perfect to the last cavalry buckle.

We never have been, and we are not now, ready to meet invasion in the event of a successful landing. Mr. Haldane himself said only six weeks ago of our Regular Army: “It was not in a state which rendered it fit to encounter a great war.” And he is still engaged

in deep thinking as to what is to be made out of the Auxiliary Forces. On the other hand, the British public is but too willing to be lulled to sleep by Blue-Water assurances, and to find in the theory of the impossibility of invasion an excuse for starving the land Services, and neglecting the organisation necessary to make effective use of such means of defence as are available. I hope that it will be understood that I am not to discuss any question between the Blue-Water School and those who hold that our insular position forms no excuse for having our home defences in the inefficient condition in which they are. The position I take up on that matter is this: That as long as the Government of this country professes to provide for home defence on land, the profession should be carried out efficiently. That it has never been done yet we all know; but there has always been a recognition of a duty to be prepared. And I say emphatically that while our condition is one of technical unpreparedness, such words as Mr. Haldane's, about what the people of this country would do in a national emergency, are as the blatant blaring of sounding brass—a make-believe which will not reassure sensible men at home, or excite anything but a contemptuous laugh abroad. The secret services of foreign Powers are too thorough in their work for “prave ’orts” such as these platform utterances to deceive the General Staff of any Continental Power.

If we are fostering in ourselves the delusion that our condition as regards trained men, *matériel* of war, and transport is not practically known in the War Departments of our Continental neighbours—that our unreadiness is not accurately gauged—then we are dwelling in a fool's paradise, and the sooner we come out of that comfortable region of complacency into the cold but bracing region of fact, the better it will be for us.

In the meantime, as my desire is to show how the forces and *matériel* we have in fact, can be brought to any point of decision with dispatch and in good fettle, I shall make the assumption that the War Minister has done his duty in providing forces sufficient in number and training, and that the Executive of the Army has had provided for it the proper equipment in arms, ammunition, and other munitions of war, and has a sufficient and instructed staff to draw upon to issue the necessary detail orders, and to see them promptly carried out. Of course, I do not know what are the elaborate and complete paper schemes which have been thought out and portfolioed in the great national defence building next door. If the schemes are not complete, and the means for carrying them out do not exist, then that gorgeous building represents but a new cup and platter with polished splendour outside, while there is rottenness, as of dead men's bones, within. Perhaps the day will come when the War Minister will no longer be a sort of humble Oliver Twist, asking vainly for more, and that the Chancellor of the Exchequer, who I believe is the only Cabinet Minister whose official dress in style and grandeur resembles that of Bumble, will no longer hold up his hands in unctuous horror at the depravity which asks for more than parochial allowance, served out from the financial buttery on the other side of the street, to the hunger-pinched Oliver of the War Office.

But making the assumption that all is ready is only for the purpose of testing whether what I have to propose would be suitable for the moving of the necessary troops and their supplies, with a

rapidity and efficiency not to be attained in any other way. And here let me say, that I may not be met in any of my hearers' minds by the thought that as we have not in fact the troops, or at least have not sufficient Regular troops, and that the other forces are not in a sufficient degree of efficiency, that therefore it will be time enough to consider problems of transportation when these deficiencies are remedied. It is a conclusive answer to any such comment, mental or expressed, to say that if the Regulars are too few, it is the more important to be able to carry every man of them, from wherever he may be to the point of decision, with the utmost possible speed, and that as regards the other forces, it will be necessary to bring them also rapidly forward, to do the best with them that can be done. I presume that no one will suggest that if a raid was being attempted we should at once sue for peace, because we thought our forces insufficient or deficient. The Ministry that did so would certainly be impeached and earn the scorn of every good citizen. Except a few peace-at-any-price fanatics, every man, aye, and every woman, would insist that defeat should only be accepted when national honour had been saved by a determined resistance, up to the point of our being faced with exhaustion of our resources.

Now, the question that I ask my audience to consider to-day is, what is the best means we have at our command for movement of defensive troops in case of threatened invasion? To answer that question it is necessary first to consider what must be the aim and intention of our military rulers in conducting proceedings against an expedition by sea attempting to invade these islands. Must it not be to prevent his effecting a landing? For this purpose the thing to be desired is that we shall be able to concentrate rapidly a fire force at the place where a landing is to be attempted—such a fire force of great and small arms as shall make an effectual landing impossible. And that we may have this, the things essential are:—

1. An accurately ascertained detail of those parts of our coast which are vulnerable from the shore, being such that a landing is feasible.
2. An accurate mapping out of the country, showing the routes available from one part to another in all directions.
3. Arrangements matured for the orderly and efficient conveyance of the troops with all possible dispatch.
4. Arrangements for a full supply of ammunition for a dogged fire resistance, for it is by superiority of fire alone that at the point of decision we can hope for success.
5. Means available at all points where there are troops assembled on the coast to move them rapidly from one point to another over considerable distances, with a full supply of ammunition.

Our purpose and determination must be first, to give the enemy no opportunity for manœuvring against us on land; and second, to meet him in force at every point at which he may attempt to occupy the shore. We must be ready to conduct the contest in the most favourable manner for ourselves, viz., by causing a maximum of loss by fire while the enemy is most exposed and in the least favourable position to return the fire with effect—that is, while he is still upon the water and cannot entrench himself or effect any secret flanking

movement, or thin out his attack, so as to minimise loss, but must come on direct, presenting his launches and his boats as well-defined targets to great arm fire for miles, and to great and small arm fire for the last mile and a half, and under every disadvantage as regards effectiveness of his own rifle fire, from his troops being crowded into bulky units, which cannot approach the shore for a simultaneous landing, unless all vessels conveying the troops conform to the speed of the slowest. There is another point of great consequence in the use of an overwhelming fire in such a case, and that is that there are very few parts of a coast where if a landing is not effected within a very few hours of the commencement of the attempt, the change made by the tide will not materially assist the defence to thwart the enemy's intention for the time being; and hours may be as important as days would be at another time. The essence of the defence, therefore, is predominance and persistency of fire at once when range admits, and its intensity never slackening, making the zone of fire impossible to be crossed. Be it remembered, also, that the ascertainment of range is much in favour of the troops which are firing over water. The enemy approaching the shore, if he uses his small arms to aid in keeping down the fire of the defences cannot tell whether his bullets are taking effect or not; but those firing from the shore can see at once where their shots are falling in the water, and the fire can be regulated accordingly. Even at night, with efficient search-lights, such regulation would not be difficult, while the search-lights of the ships of the attacking fleet could reveal nothing of the defensive dispositions, and if used must assist the defence by throwing diffused light over the water which their shore-seeking boats are passing over.

Now, if this be what we must aim at in our arrangements, the first question is whether the means which we have had at our hand for many years for rapid and effective concentration are not sufficient and the best. It is true that we possess a large network of railways, and many would naturally say that transit by rail must be more speedy than transit by road. War Office officials may suggest that we have a duly appointed Railway Service Corps which could be depended upon to do all that was needful. It is part of my purpose to convince those who so think that such a view is erroneous.

Paradoxical as it may appear to make the assertion that a railroad is not in present circumstances the best means for rapid movement on a large scale, when emergency calls for swift concentration of men and *matériel* for national defence in a country like Great Britain, it is nevertheless a true assertion. Our ideas of rapidity in travelling naturally centre on railways as the embodiment of speed; but whenever it has become possible to travel by road at a speed such as is attained by the ordinary power vehicle of to-day, the railroad for military purposes must take second place, and that for the following reasons:—

1. The conduct of traffic by rail involves an elaborate adjustment for the ordinary traffic. The moment that adjustment is seriously disturbed, the readjustment is necessarily a work of difficulty, and cannot be done or brought into smooth working at a day's notice.

2. The gathering of rolling stock and haulage engines to the places where the suddenly arising emergency makes them necessary, and the marshalling of the rolling stock into the needful detail, must absorb much valuable time, and can only be done by a skilled and practised railway staff accustomed to act together, which could not be

the case except on the main through lines, while it is highly probable that the lines crossing the country from one company's system to another might be the most important.

3. The whole proceedings for rail transit must be carried out by concentrating large units, which must be brought to a rendezvous and entrained in bulk. There is no possibility of picking up small units here and there, and pushing them forward to join their corps at the place near the front where the larger unit is to act, or camp, or be billeted. The smaller units, companies and sections of landward Volunteers must be drawn together before any practical movement by rail can be made.

4. The whole ordinary running of trains on the line must be stopped altogether, or must act as a constant obstruction to the forwarding of the military trains.

5. As the railroad does not admit of fast traffic passing slow traffic except at intervals of several miles, there would be much delay and often serious congestion, and the presence on the line of traffic which it was not of importance to forward quickly, might nevertheless block traffic, the speedy forwarding of which might be of vital consequence.

6. As the traffic is confined to rails, an accident (even slight) may block the line for hours, when every minute may be precious; and it is certain that accidents are most likely to occur when an established time table is suddenly thrown over and many trains crowded on to the line, officials over-worked, and drivers compelled to run on parts of the railway line which are novel to them and for (it may be) long hours.

7. The place where troops are most wanted may be a day's march or more from the station at which they must detrain.

8. All transit of *matériel* by rail involves the delay caused by three loadings and three unloadings between wagons and trains, the latter probably conducted in many cases under great difficulty from deficiency of available loading banks.

9. Much delay caused by the difficulty of providing sufficient road transport to carry *matériel* from the arrival place of the train to the place where it is required, and by the slow movement of such transport.

10. Probable confusion from the numerous transfers between road and rail vehicles.

On these and other grounds, which there is not time to discuss, I do not hesitate to say that with the means for transit which we now possess it would be easier, quicker, and more convenient in the case of it being necessary to move troops and their munitions and *matériel* of war during the first days of, or resistance to, invasion, to employ road power vehicles for the service of conveying the infantry, with all requisites for its efficiency and maintenance, and that over any distance not exceeding 150 to 200 miles, leaving the railroad free for cavalry, artillery, and bulk *matériel*, and also for ordinary traffic, so as to interrupt business as little as possible.

My main proposition is that there has been presented to us by the development of the motor road vehicle during the ten years that have elapsed since power traction was allowed practical scope for development, means for giving efficiency to national defence on land, such as we never possessed before, means which, if organised during peace for application in time of war, will give increased value to every power on

land that we possess, and that to a degree so great that it can scarcely be overestimated. There can be no doubt that in the case of an invading force endeavouring to effect a landing, speed in sending forward forces to oppose it, both as regards journey speed and ease, of bringing the troops to selected places for defence, might make a small force more effective than a much larger number if the time necessary for bringing the latter forward was greater. Now, at the present moment, we have more than 120,000 vehicles on the road moved by mechanical power, and to add to these there are many thousands more standing ready for delivery, and many thousands more in the hands of second-hand dealers, a large proportion of which are quite efficient. It may give you an idea of the progress that is being made if I mention that in this country we are turning out about 500 new vehicles every week, while our imports from abroad are colossal, amounting during the past year to a value of £4,371,000 sterling. All these vehicles are capable of covering 150 miles in a day, and many thousands of them could do 250 miles within 12 to 15 hours. They will also be—to the number of 80 per cent. at least—as able to do a second day and a third day's work as they were on the first, and still be ready for more. It will illustrate to my non-motoring hearers what the road vehicle can do if, at the risk of appearing egotistical, I give them an illustration from my own recent experience. A few months ago I had to drive a car weighing a ton and a half from Coventry to Edinburgh, a distance of 326 miles, and circumstances made it necessary that I should be only two days on the journey. My son and I—driving alternately—reached Carlisle in time for dinner on the first day, driving through the busy streets of Warrington, Wigan, and Preston, and the narrow streets of Lancaster and Kendal, and lastly in the dark over Shap summit and through Penrith, covering in all 223 miles. On the second day we arrived in Edinburgh—103 miles—before two o'clock in the afternoon. It must be plain to everyone that in a country so well intersected by good roads such vehicles could, on emergency, do by the free and open road what it would be impossible to accomplish by rail.

Now, as regards national defence, the great point in favour of the road is, that the country being narrow, any defensive forces which might be available in central parts of the area could—given a good preparatory organisation, be moved, by a great number of roads, to any point or points on the coast to east or west or up or down on very short notice. For example, forces in Sunderland, Darlington, Manchester, Bolton, Bradford, Leeds, York, Huddersfield, Sheffield, etc., and in all the country surrounding these centres could be transported in one day's running from most of them, and in two day's running from the others, to the Yorkshire, Lincoln, or Norfolk coast, or northwards to the Northumberland or South-East Scotland coast, or to Liverpool, Barrow, or Southport, while in the same way the forces of these western places and of Liverpool, Preston, Wigan, Warrington, Birmingham, Cardiff, and Bristol, etc., could be taken eastwards with equal facility. The south could be reached from London and Bristol, and even from Birmingham, Wolverhampton, etc., in one day. These are illustrations merely. I state with confidence that many thousands could be dispatched by road from any district in any direction, and be half way to their destination before they could be concentrated at special centres in railway stations, the necessary rolling stock and haulage power organised and brought into position, the forces en-

trained, and the adjustment of traffic made to enable the requisitioned trains to use the line with anything like real dispatch. To take one or two central places as illustrations. A force in Birmingham could reach London, Portsmouth, or Plymouth, Hull or Harwich, Liverpool or Southport, or forces in Manchester or Preston could be moved to Carlisle, Newcastle, or Sunderland, and up to Edinburgh or Glasgow in one day, and it may be questioned whether this could be done on short notice by any of the railroads, particularly where the route was across country and running over lines owned by two or three different railway companies, such as in the case of an attempt to carry troops across from, say, Cardiff, Wolverhampton, or Birmingham to Hull or Harwich or Colchester.

As regards speed, every motorist knows that except in the case of express trains, it is as quick and often quicker to start direct from one's door, drive 50 or 60 miles, and arrive at the place at which our journey really ends, than to drive to a station, await the starting of a train there, and be turned out of the train some distance short, or it may be beyond, the place which forms the real goal of the journey.

It may illustrate what I mean more closely to refer to a place which has become classical in connection with invasion problems, the town of Dorking. It is, as you know, on the South-Eastern and Chatham line. An ordinary train travelling between London and Dorking is entered in the time tables as taking an hour and twenty minutes to make the journey. I shall assume, and the assumption is a large one, judging by my own experience, that the time is kept. To that time has to be added at both ends time for reaching the station, waiting till the train starts, and time for detraining and going to the place which you desire to reach, which of course is not the railway station. In that way the actual journey will occupy at least an hour and a half, allowing only five minutes for reaching the station and entraining, and five minutes for detraining and getting to the true destination. Now, that journey from point to point could easily be done by motor vehicles, driven with care and consideration, in an hour and a quarter, and they could return light to London at once in an hour and five minutes and bring another load, and could repeat this time after time through a long emergency day of, say, 16 hours, doing six trips without difficulty. Even a motor omnibus, running only at an average of 12 miles an hour, would accomplish the distance in two hours and ten minutes, and could certainly make three journeys up and down in a day of 16 hours. We have now nearly a thousand such omnibuses in London, and we shall at least have two thousand by the end of the present year. Assume that only 1,500 could be made available, and putting the load at the modest figure of 30 men, these 1,500 vehicles could in six journeys convey 275,000 men over any similar distance in 30 hours. This is a fair and unimpeachable illustration of the vast resource we now possess for rapid road movement on emergency. Double the distance, and the journeys must be halved; but even that would mean the movement of 137,500 men for 52 miles in one day, the proportion of men being in proportion to the mileage to be run. Nearly 45,000 men could be conveyed 180 miles if necessary in one day by the 1,500 omnibuses.¹ Of course, forces conveyed

¹ This, of course, does not mean that all would arrive in a day's time, counting from the starting of the first vehicle. It means only that the time on the road of each vehicle would be less than a day.

by fast-going autocars could do double the distance at least that the omnibuses could accomplish. There would be in London and the neighbourhood at least 10,000 such vehicles, which, at a low estimate, could carry 40,000 men. I give the number at 10,000 in order to keep well within the mark, begging only that it will be remembered that the number is being augmented by hundreds every month.

Road transport for goods by mechanical power is also rapidly increasing. I may mention that already such a firm as Pickford's have power haulage equal to 480 tons load; that many other companies are rapidly superseding horse power for conveying goods, one great firm being in course of substituting 300 power-driven vans for horse-hauled vehicles. These are indications of how the wind is blowing. And, be it remembered, that such goods wagons could on emergency carry large numbers of men as well as *matériel*. Can anyone doubt, in face of these facts, that if it is possible to utilise promptly and efficiently the power vehicles we possess, in the event of a national emergency arising, the advent of the motor road vehicle has added enormously to our defensive power?

But the value of this mode of utilising the road is not to be measured merely by the general convenience for free and fast transit which it presents. It is obvious that even if other things are only equal, the efficient road vehicle has another very great advantage over rail transit. A railway line approaching a coast has only one head. It necessarily, if it be a line coming from a central place, has one terminus at the coast. When troops are brought up by it they have still to be distributed over the line of coast which it may be necessary to guard against the attempt of an expeditionary force endeavouring to effect a landing or landings. Therefore if the troops are brought by rail they must be distributed either by coast lines or by road marches, or by both, to the points at which the strategist conducting the defence desires to post them, and thus will necessarily take longer time in reaching the place where they are required. Whereas if troops are being brought forward by road they can be distributed from intermediate places direct by road to their different stations. For example, if the Yorkshire coast was threatened, and a force of 20,000 or 30,000 men was drawn to Manchester from the West, and was moved on with orders to report at Leeds, the commander of the forces, learning of the dispatch by telegraph, could, by telegram to Leeds, order the whole or part to proceed from Leeds in the direction of Hull, or the whole or part in the direction of Scarborough, through York, or the whole or part on Whitby, being always able to keep in touch with them by the telegraph or motor cycle, as they passed through towns and villages, so as to have them thoroughly in hand for any change of disposition, either of direction or diversion in different directions, that might be necessary in consequence of the enemy's movements. For example, he could change their direction by telegraph from Hull and send a column northwards to Stockton and Middlesbrough, whereas he could have no such freedom in dealing with the troops if once they were in trains moving on a fixed railway line. When the troops are once entrained they are committed to such routes only as are laid with rails. There is no choice of roads, no possibility of freely changing direction. Flexibility in movement is impossible. The troops are, as it were, locked up in boxes, dispatched under a time table, and the Chief Command must wait until they are liberated before he can deal effectively in directing their detail movements. On the other hand, when he has them

on roads he can convey effective orders to them at any time by dispatch sent to intercept them, or by use of the telegraph to communicate with the commander or the staff officer going with the troops, and the change of direction can be effected without the loss of a minute of time. In short, he would have as much freedom in dealing with them as he would have if they were on foot march at $2\frac{1}{2}$ to 3 miles an hour, with the advantage that he could calculate that they were making their way in the general direction of advance at a speed equal to five times that possible by marching, and without limit as to distance, and that they were able to move at the rate of more than 150 miles a day, arriving unfatigued and ready for action. In short, such a mode of conveyance gives the maximum of facility to modify plans, to move freely, and to change direction. On the other hand, the railroad is the very worst mode of conveyance, if any sudden change of plans and consequent change of destination of troops is necessary.

Further, a mode of conveyance by power vehicle on the road would be of great value after the front had been reached in enabling the commander to transfer large bodies of men in any direction he pleased and without an hour's delay. He would have the further advantage of freedom from the necessity of considering any question of fatigue, and would be certain that he could move them from one part of the coast to another by direct journey and at a much higher speed than that which an expeditionary force moving by sea could possibly attain, and bring them to the desired point thoroughly fresh and fit. Nor would he have to consider the condition of animals—always a very serious matter in land war operations. His road vehicles would only require overhaul, oiling up and fuel; there would be no need to give time for recuperation of exhausted energy. This would be of priceless value, not only as regards conveyance of troops, but even more as regards transport haulage. There would be no such ghastly and wasteful using up of horseflesh, as so often takes place in war, when at times the salvation of a force and the avoidance of a military disaster can only be effected by a cruel exhaustion of animal power. The power vehicle may be injured or may fail, but it can be towed with its load, and can be mended, whereas the overworked horse must often perish, and the call upon other horses to do its work as well as their own means still further destruction.

All that I am saying in favour of the power vehicle may seem like an idle dream to those who have not given attention to what is being practically accomplished by power haulage at the present time. But so certain do those who are observant feel, that they can confidently say that what is already in actual operation exceeds all that could have been pictured by the wildest dreamer of twenty years ago. And to no country in the world does this development present such inestimable advantages for land defence as it does to our own, provided only some of the deep thinking, of which we hear so much, is devoted to it.

Time will not permit that any elaborate detail should be stated for the carrying out of the preparation for a practical use of power haulage in national defence; but I may in a general way, and as giving points for criticism and discussion, suggest in outline what might be the preparatory organisation for such a transportation of troops and their necessary munitions, etc. For, of course, without some definite arrangement made in time of peace, there might be much dangerous delay and confusion when the time for action came, especially as it

must be assumed that it would come suddenly. An attempt to improvise might prove a disastrous failure. Any Power which aimed at a military raid on this country would necessarily endeavour to make it as much as possible a surprise, and probably make feints in one direction or more, while the real expedition was intended to act in another quarter altogether. The problem therefore is to have such an organisation ready for application as will ensure an orderly, rapid, and efficient transfer of troops from any one part of the country to another, to bring them to the front, and to move them as required when there.

To make due preparation in time of peace for such work in the event of an imminent invasive attack, the following are suggested as steps to be taken:—

First.—A register for each great town, and a register for each county or convenient sub-division of a county, of all the power vehicles classified as private cars, public passenger conveyances, and slow traction vehicles, with the carrying capacity and horse-power of each.

Second.—A register of all places where fuel for internal combustion engines is stored.

Third.—A power given to the Sovereign in Council when invasion is threatened to issue requisitions for the services of motor vehicles and registered drivers, and requisitions for supply of fuel for the vehicles, all on terms duly adjusted and published in time of peace.

Fourth.—Rendezvous to be fixed for the assembly of power vehicles, to which the vehicles of the place and neighbourhood shall proceed respectively on proclamation being made for such assembly in any particular town or district.

Fifth.—A staff to organise the dispatch or reception of power vehicles—and if need be, re-dispatch—according to the direction in which the movement for the coast requires to be made, or to be altered from time to time.

For this purpose I would suggest that the whole country be mapped out into districts, and that for each of these districts there be a staff appointed to take charge of, and dispatch troops from the district or through the district by road in any direction ordered through the General Staff. This local dispatching staff might be selected from officers on the Army Reserve, the senior in each place being one who had served in the Regular Army, and the subordinates being retired officers of good report in the Auxiliary Forces, of whom there are many of practical experience in handling men, but who from exigencies of business or other causes have been compelled to resign, while still quite fit to serve, and most willing to do so on emergency. When there is sufficient choice the gentlemen selected from both classes should have some practical knowledge of the power vehicle. This staff when appointed would be required to organise their districts, fixing for the different towns and villages what motor vehicles were to proceed to the various rendezvous on proclamation being issued, so as to ensure an adequate supply of vehicles for the troops to be conveyed.

It is not possible now to give even an outline of all the detail arrangements for working out the movement of troops by the road in this manner when a summons came to be sent out for assembly to resist invasion; but the idea would be, that the vehicles as they arrived at the rendezvous should be marshalled in classes according to horse-power and speed, and that the troops as they arrived should be sent off in groups of cars, each group under an officer. All the marksmen of the corps might be sent off first in charge of an officer and musketry

instructor in the fastest cars, so as to reach the front as soon as possible. It should be part of the orders that every man should bring with him sufficient food for two days, for which he would be compensated. This would make it the more easy to alter routes with freedom. If food had to be provided for the troops as corps or even as companies during the journey, it might cause delay, and would make it impossible to alter direction at any part of the route where it might be desired to do so, according to the changing exigencies of the situation.

Each vehicle would require to be provided with the fuel necessary to bring it to the outmost point towards which it was to go on its first journey.

All vehicles which could only take two persons would be used to carry forward spare ammunition with the troops, the driver only riding on the car. Some of the faster of these could be utilised to carry staff officers.

When the high-speed passenger-carrying vehicles had been dispatched, any remaining troops would be sent forward in the heavier class of vehicles, and the remainder of these vehicles would be held by the motor staff at the disposal of the supply and transport officers for commissariat and other supply services, including the sending forward in bulk as it was collected from the registered dépôts the fuel necessary for replenishing the road vehicles.

If time permitted I would like to describe how easy it would be to set up camping shelter by the use of motor vehicles as supports for canvas sheeting, after the excellent device of my late friend, Captain Tomkins, called the tortoise tent. A tortoise tent stretched out from a motor omnibus or limousine or landaulette car could accommodate 150 men with ease, and the tent part of the arrangement would not occupy more space when folded up than two ordinary bell tents taking 14 men each. I have had similar tent accommodation in camp, and it was in every way satisfactory.

There are many other valuable services which could be rendered by the power vehicle at the scene of conflict, such as towing great guns from place to place, towing field guns when on the road, so as to keep the horse teams fresh for over-country work in heavy ground, and up steep ascents. They would also afford excellent cover to a resisting force, in the event of any portion of the enemy succeeding in landing. They could be kept under cover ready for use, and so enable an overwhelmed force to hold on much longer than it otherwise could be allowed to do, the vehicles being ready for rapid withdrawal before an enemy that had no fast conveyance available. The motor vehicle would be to the defending troops what the ponies so often were to the Boers: a means of getting safely out of range when things were becoming critical, of course, with this limit, that they must keep on the roads.

In all that I have said it is only the motor vehicle that is the property of the private citizen or company that has been spoken of, whether it be a carriage for persons or for goods; but, of course, I assume that in the near future, if not already, the war authority will follow the lead of the citizen, and adopt the power vehicle as part of the military organisation for purposes connected with war.¹ The

¹ Since this was written it is satisfactory to learn that the War Department has taken the step of arranging for the registration of motor vans and omnibuses for purchase or hire when necessary.

adaptability of the heavy power vehicle to many such purposes is indisputable. For rapidly moving machine guns and their teams, for travelling workshops, telegraph and telephone wagons, ambulances, and for conveyance of bulk material between the railways and the camps, the power vehicle can render service far beyond what can be accomplished by animal power. Moreover, a motor vehicle for military purposes can have a capstan drum, which, when put in gear, can be used for warping purposes with block and tackle; steep ascents can be overcome, so that even the heaviest guns can be taken up stiff gradients without difficulty, and trench ploughing can be executed without the necessity for special engines. Motor bicycles can also be used in the regular service for rapid conveyance of intelligence and orders. And all this with the paramount advantage that a commander can be sure that he has abundance of power for conveyance and for mechanical work, without its being an expensive and troublesome burden when idle. A parked mass of power vehicles costs nothing but the price of a little waste and cleaning oil when there is no work to be done, and the vehicles are ready at a minute's notice for work far beyond what could be accomplished by animal haulage.

We are only at the beginning of the utilisation of power traction for war. Its possibilities, and especially in national defence, are as yet not to be measured. Every month will bring new light leading to new developments. Indeed, power vehicles, if we will spend some thought and a little money on organisation now, while we have time, will, I venture to predict, prove a most valuable addition to our defensive strength on land. All I can do now is to plead that the question of its value be considered, and if it passes the ordeal of the deep thinking which is now being exercised upon our national needs, that it will not be pigeon-holed, to be considered from a practical aspect some day, but that it will be practically dealt with now. I have some hope that it will be so dealt with now, unless the *vis inertiae* of the permanent official is too strong for our new War Minister. I would fain believe that he will see that the provision of a sound working system for moving the troops we have is quite as urgent a matter as increasing their efficiency if not their numbers. We must take many days to bring our forces up to what they should be, and as long as they are not, the greater is the risk caused by our not being in a position to be able to use what we have with promptitude; and this we cannot do unless we fix upon our method and organise for its execution before the day of need.

It may be that we shall never have to face an expedition sent to attack us in our own land, but it is a risk against which we are bound to be prepared. One of the cheapest as well as the most practical and efficient departments of preparation would be an organisation for utilisation of the power vehicle, and I hope I have persuaded you that its use would be of the highest value. Can it be doubted that if it were known abroad that our defensive forces, whatever they might be, could and would be brought with the utmost dispatch to any part of our coast that might be threatened, with a preponderance of fire power over any force that could be collected and brought across the sea, that knowledge would have a considerable influence in the counsels of any nation that contemplated a raid? For unless we assume that the British fleet has been destroyed, a raid could only be successful if the hostile expedition effected its purposes by forcing our defences and establishing a footing before our fleet could reach the scene. And what might a stubborn fire resistance not effect in

holding the enemy in check until the fleet should arrive and take up its part in silencing the enemy's guns and making untenable the position of any force attempting to land, or landed but held in check in advancing?

It is in the belief that we have in the motor vehicle a powerful addition to our potentialities for defence that my endeavour has been made to interest my countrymen in the consideration of the matter, and I conclude by earnestly commending it to their attention in the hope that our military authorities may be induced to take it up without delay and on practical lines. I suppose no one doubts that there is in our British race the pluck and stubbornness to justify Mr. Haldane's optimism as to what the people of this country would be willing to do for their native land in a national emergency. But pluck and stubbornness and willingness in a man are of no use unless he can be brought to the place where he is wanted in time. Without an organisation ready prepared for moving troops we are in the same position as regards land defence as the plucky and stubborn London Fire Brigade would be if their employers told them that they must get to the fire as best they could without horses or motors in the meantime, and assured them that they would keep on thinking what the best way might be for bringing along the means of fighting the flames to the place where they were wanted. It is earnestly to be hoped that similar folly will not be committed in the question of national defence. I have endeavoured to state what I believe to be the best means for securing that what forces we have may be rapidly brought to the place of decision. If better means exist there is no more to be said. If better can be devised, by all means let them be adopted and put in working order; but as long as the means are not fixed and not in order, the potentiality of any land defence forces we possess is only a fraction of what it should be, either as a deterrent to any other nation that might contemplate an attack, or as a resisting power if an attack were made.

Believing, as I do most firmly, that the power road-vehicle of to-day adds enormously to our facilities for effective use of our defensive forces, I would most earnestly press for a consideration of the matter, and if what I have said is accepted as true, would urge that we lose not the benefit of this valuable auxiliary to our power of rapid action on emergency, but without delay develop the necessary organisation to make it effective. It cannot be effective unless it be organised in time, and that is, before the day of need.

The CHAIRMAN (Colonel Sir R. Hennell, D.S.O.):—The Secretary has just received the following letter from the private secretary to Lord Montagu:—"Dear Sir,—I am greatly distressed to learn from your messenger, who has just arrived, that the reading of Sir John Macdonald's paper was fixed for 3 o'clock. Lord Montagu has been under the impression all along that the hour was 8, and is coming up specially from the New Forest to take the Chair at that hour. Will you kindly apologise to Sir John and to all present, and explain how it is his lordship is not there. He will, I know, be more than sorry when he hears of the mistake." As I shall probably have to leave before the discussion on this very valuable paper concludes, perhaps you will allow me to say just a word of personal thanks to my old friend, Sir John Macdonald, for his lecture this afternoon. I think he has been a little hard on Mr.

Haldane. He twits Mr. Haldane with being an "Optimist"; but Sir John is one himself. Sir John is one of our greatest "Optimists," and one of the greatest believers in the Volunteer Force. He is almost the father of the Volunteer system, and there is no man in this country who has done more for that force than he has. I think, if he will wait a few days, or perhaps a few weeks, until Mr. Haldane has enunciated his plan for a national territorial army, mainly composed of Volunteers, he will find that many of the valuable suggestions he has made in the extremely able essays he has written from time to time, during the last thirty years, on the Auxiliary Forces, together with what he has told us this afternoon, will be found not to have been over-looked in Mr. Haldane's scheme, when it is placed before the public. There is one little point in the paper which I would like, with all due deference to Sir John Macdonald, to criticise slightly. Speaking, as he did very rightly, of the value of being able to take troops along the roads by motor vehicles, he made a statement in the course of the paper which I think he will, perhaps, desire to rather modify. He says it is impossible for a commander-in-chief, or any military officer in charge of military forces, to divert the troops when they are moved by railway. I think, considering that in this country we have stations every few miles, sometimes under a mile, troops moving by our railways can be diverted at any point under instructions from headquarters. But that does not at all nullify Sir John's able dissertation on the enormous value of the motor vehicle. He, as honorary colonel of the Royal Motor Reserve, will, I hope, be in the position to see that this scheme for Volunteer Auxiliary road transport is taken the greatest advantage of at the War Office. I would only add that, as an old soldier, and one who commanded a Volunteer battalion for over ten years, I am in perfect accord with Sir John Macdonald in all he has said, as to the value of Volunteer motor transport, as well as all he has written in the past as to the great potential resources the nation possesses in the Volunteer Force. Assets of a military character, which exists in our civilian population, which only requires to be tapped and encouraged, to be the bedrock and backbone of a National Army. The Army Motor Reserve, of which Sir John Macdonald is honorary colonel, now an integral part of His Majesty's Regular Forces, is but another proof of this fact.

Mr. EDWIN N. HENWOOD, I.N.A. :—I would thank you to listen to a few remarks, because I know that the French Government are taking very particular interest in this question of conveying troops by motor wagons and motor vehicles all over the country. In addition, they have taken particular interest in a resilient wheel, which will enable travelling by motor on ordinary roads to be infinitely more comfortable and reliable than it can be at the present time by the use of any description of rubber-tired vehicle. It is a wheel which enables the load of the carriage to be distributed upon a considerable amount of rubber, so that travelling over the roughest roads will be rendered much less difficult. I may also mention that some other foreign Governments are taking particular interest in the question of moving troops and materials by motor vehicles. I know that in the late South African War certain motor traction engines were taken out and were used for the haulage of provisions, materials, and fodder for the horses over long distances, which could not have been undertaken by ordinary horse transport; and, therefore, we have every reason to congratulate the author upon having drawn public attention to this subject.

Major R. MURRAY LAWES, R.G.A. (Mil.):—I am sure we owe a very deep debt of gratitude to Colonel Macdonald for bringing this most important question before us. As one of the commanding officers of our fast expiring submarine mining divisions, it might, perhaps, be thought that this branch of the Intelligence Service of the War Office did not affect us; but we have often conferred amongst ourselves privately as to the various reports coming from those sides of the Channel from which we might be attacked, especially with a view as to the speed necessary for laying out our mine fields in the Nore and Thames. We have ascertained privately at different times, in spite of all we have been told at this Institution on many occasions, that large forces of troops could (remarks as to dinghies are rubbish) be landed on our shores, and that the only means of opposing those forces at various points on our coast are the means by which large forces of about twenty or thirty thousand men could be moved almost momentarily, and placed near the spot where the invading force is likely to be landed. For instance, there is the east coast, Sherringham, and the south coast, Torquay, Shorham, Whitstable, and all sorts of places further up north, where large forces could be landed. Therefore, if we are to send a force of men to engage the enemy, that force must be placed at some place in the centre of England, say Reading, Oxford, or some town in a position which is in communication with the spokes of the main roads which run out of London. If a force, having a large number of motors, were placed, say, at Reading, it would be available for despatch to Bristol, the whole south coast, Sherringham, or Brightlingsea, or even, perhaps, as far as Hull. I believe that is a thing which could not be done by the railway. Troops in motors could be almost treated as units themselves. They could be moved with provisions, which would last for four or five days at least; and if the motors carried machine gun detachments, those machine gun detachments would be more valuable, perhaps, than fifty men, when firing into crowded boats, and less exposed to the scouring fire from battle-ships. If you carry two guns on every motor, with the men to man them and spare ammunition, those guns, if they were brought to the places immediately where landings were likely to take place, would have the very greatest effect in averting the disaster, to which at the present moment there is no doubt this country is exposed. I must thank Colonel Macdonald and the Council of the Institution for bringing this most important question before us. One very important point to bear in mind is, that the motors can carry tents about with them, or the men can live in a motor if it has a cover. In that way they can move about from one place to another like gipsies. That sort of thing, I believe, has never been done; you cannot do it by using a train, and it never will be done in any other way than by using motor cars. But I think in adopting motor car traction for military purposes a little common sense will have to be used. It has been customary in the ordinary way to move the cavalry to the front in any expedition. If a general were to do that nowadays, and back the cavalry up with troops conveyed in pneumatic-tyred motors, I think a very great mistake would be made, because this is what would happen: You would have your cavalry going along the road kicking up the stones and flints, and making it almost impossible for pneumatic-tyred vehicles to use those roads. I think at the present time the motors and cyclists should go before the cavalry. If the motors and their detachments are lost, they must be sacrificed—you must have some losses in war. But if you put the cavalry in front of the motors, the whole force would be decomposed. The men in the

motor cars would be in the ditches most of the time mending their tyres, and would be of no use at all; but if they were put in front they might render most efficient service, and if they were lost it would not matter. It would stop the landing to a certain extent until the main force came up. I believe we have had some experience of that kind in the Boer War lately. I fancy General Buller was very much disconcerted with the way in which the Boers managed to move 10,000 men from one place to another whenever we tried to attack them; they moved on horseback across the country. In the same way, on our roads we could easily move men on motors, and do exactly the same thing as the Boers did when they surprised us. In conclusion, I again desire to thank Colonel Macdonald for his interesting paper.

Captain H. H. POUNDS (Australian Forces):—As a visitor from Australia, I have been deeply interested in this most admirable lecture, and there is one remark I would like to make concerning the difficulty of the transport of troops on railways. I served throughout the Boer War with an Australian contingent, and I frequently saw the very great difficulties that occurred on the railways. There is one important item which Sir John has omitted to mention in connection with the advantages of motors over railways, namely, the liability of bridges and culverts to be blown up during war. On many occasions on the various lines in South Africa the railway traffic was absolutely disorganised because the bridges and culverts were blown up, not only before but behind the trains. With regard to the Chairman's criticism as to the ease with which traffic can be diverted, I would like to refer to one particular incident, which is within my knowledge, in which Lord Kitchener and Sir Percy Girouard were interested. It occurred during the latter part of the war, when a series of raids were organised in the Western Orange River. Lord Kitchener instructed Sir Percy Girouard that he required so many trains at a particular point at a particular time to move a number of men to a definite spot. Sir Percy Girouard told Lord Kitchener that he could not possibly do it; Lord Kitchener told him he had got to do it somehow. Sir Percy Girouard replied that it was impossible, but that he would do his best. He started to send the trains along. Naturally, as an expert railway man in such a matter, when the trains got to the end of the journey he wished to bring them back to take more troops; but he could not send them along fast enough for Lord Kitchener. Lord Kitchener told Sir Percy that he must work quicker. Sir Percy Girouard told him he could not, so Lord Kitchener said: "I'll do the job myself." Lord Kitchener thought he knew how to do it, and he tried, with the result that he got the whole of the lines blocked up and could not get his empty trains back again to carry the men. Eventually the result was that he wired to Sir Percy Girouard to do the job himself. I only mention that little incident as a practical illustration of the difficulty of diverting railway traffic.

Mr. SHRAPNELL SMITH:—I am here by invitation as the representative of the Motor Van, Wagon, and Omnibus Users' Association, one of the bodies which contributed to the arranging of the scheme of registration to which Colonel Macdonald has referred. I am very considerably interested in much of the contents of this paper. It seems to me that this country stands to gain a great deal more than any other European country from the point of view of the organisation of the motor vehicles of the country, by reason of the fact that, whilst the mileage of our roads is n- greater in the aggregate than one finds in other countries, the percentage

of our roads to the area of the country is so very much greater. Therefore, access to the different points along the coast is much more easy than in any other country of Europe, and of course much more so than in any other less developed country in the world. In the course of his paper, Sir John has suggested the adoption of certain procedure in connection with the possible arrangements of this auxiliary force for repelling the invasion of this country. I venture to remind him that the first suggestion he makes, namely, the completion of a register of motor vehicles for each town and county, already exists under the Motor Car Act of 1903. Therefore there would be no difficulty in gaining possession of a proper list of owners. But when one comes to the second suggestion: A register of all places where fuel for internal-combustion engines can be obtained, it immediately brings one up against the sore point, that we are dependent upon an imported fuel for the driving of so many of these motor vehicles. For the last ten years—ever since I became interested in the question of heavy motor traffic—I, in common with others, have always spoken out for the steam vehicle as having a future before it. Although it has been a popular idea that the internal-combustion engine was going to put steam out of court altogether, it is satisfactory, I think, in this connection, especially from the point of view of the heavier machines, to know that there are a very large number of steam-propelled vehicles in this country which would be dependent only upon coal or coke and water, and not upon any imported fuel; and also that, as matters are developing now in connection with motor omnibuses, there is every likelihood of a large percentage of vehicles propelled by steam coming into use. There is one general remark I would like to make on the subject of the lecture, namely, that anything on the lines suggested with regard to the organisation of motor vehicles for defensive purposes would, I am afraid, be hopeless if it were not rehearsed in advance. If the motor 'bus drivers of London especially—I am not referring so much to the drivers of private vehicles, because they are used to going about the country to a very considerable extent—were called upon to go from London to the Norfolk coast, and take down twenty or thirty passengers in each omnibus, I am afraid there would be a very great many catastrophes on the road. I do not say they would be as bad as the catastrophe at Hand Cross, but I know from my experience of driving that when such men are driving in the dark on roads with which they are not acquainted a very considerable percentage of cars run into the ditch. Therefore before anything of this kind could be effective, money would need to be set aside for a considerable amount of drill.

Major C. E. I. McNALTY, A.S.C.:—I have very little to say on this most interesting lecture. All that Sir John has said has been, I think, for some time in the minds of all soldiers. As Mr. Shrapnell Smith just said, there is a system of registration of vehicles in use throughout the country which is now being put into the form of an organisation, and which will be available for the future, so that, especially in times of emergency, we shall be able to call upon every one of them. I myself am in command of the mechanical transport of the Army Service Corps, serving in all parts of the United Kingdom and outside of the United Kingdom, and we have been developing on the lines of being independent as much as possible of the fuel except that of the country in which the vehicle is being worked. What Mr. Shrapnell Smith has said as to steam vehicles using fuel which is produced in the country is very true; but there is a fuel also for internal combustion engines which can be produced in every country, namely, alcohol. This fuel is being tried in

Germany and France by the Governments of those countries, and the heavy and light engines of the German Army have been using alcohol to a considerable extent for some time. In fact, the development of alcohol as a fuel is a matter of the future, to which we can look forward to with a considerable amount of certainty. If we can arrive at a really practical method of using alcohol, which can be produced in any country, we are independent of supply of fuel from other countries, and we shall obtain a fuel which is very small in bulk and weight compared with coal. The steam engines which are used mostly in omnibuses and vehicles of that nature use a heavy oil fuel instead of coal, and I think there are very few of such rapidly moving vehicles using coal; so that if we can induce engineers to develop the use of alcohol, then we have something in the United Kingdom which will make us independent of outside.

Colonel Sir JOHN MACDONALD, in reply, said:—I must begin by expressing my very sincere thanks to the gentlemen who have criticised my views, for the very kind way in which they have dealt with my lecture. Their remarks lead me to believe that there is something practical in the paper, and I hope the consideration of it will not die down, as motor traction died seventy years ago through being smothered by the railway companies and the lords and squires who did not favour a new thing being brought in, with the result that for seventy years we have not had the means of locomotion which we might have had. The motor car is now well established as a mode of safe locomotion, and let us hope it will be well considered, and that as soon as possible, from a military point of view. I was glad to hear what Mr. Henwood said, because I noticed the other day that General Picquart, the French War Minister, is making a register in France of all motor cars that are suitable for the purpose of carrying troops, which shows that he is quite alive in his Department to the present importance of the matter. I hope that his spirit will be infectious, and that it will infect our own Department. I hope it will be a microbe which will be beneficial and not injurious. Sir Reginald Hennell criticised, and very justly, one remark I made. Perhaps I may have made it too strongly. I did not intend to state that it was impossible, when you had started troops off in trains, to divert them at certain points if you wished to divert them. What I intended to express was this: That one might just as well not have a fast transit from one place to another by railway if, when the journey is half done, you have to stop the trains at a particular place, take the troops out of the trains, and put them in other trains to send them somewhere else, because you cannot do it without great loss of time. As I have said before, your railway line must be worked by a time-table, and a general cannot subvert that time-table, certainly within twenty-four hours. It cannot be done. The safety of the line requires that the officials should know what trains they are going to run and whither. Captain Pounds told us of an attempt made in the South African War by a very distinguished general to take over the management of a railway line from a railway expert, and how he came to grief; but that, of course, is entirely confidential between ourselves; we shall not say anything about it, although it is instructive. But with motor traction you may have a string of several hundred motor cars coming along the road, the fastest ones in front, leaving a good gap between them and the next lot. When the fastest ones arrive at a particular place, the staff officer can meet them at, say, the junction of two roads, and by the motion of his hand send them to the right or to the left. For instance,

instead of going to Hull he sends some of them to Scarborough, and others to Whitby, and others to Sunderland. It is done without the loss of a single minute of time. Another speaker expressed an opinion about the difficulties of transport by railway, with which I agree. As regards the use of the autocar for camping purposes, there is no doubt it can be done. In that connection I only wish more attention had been paid to the tortoise tent. I had a tent in my camp; I think it covered a space nearly as big as this room. It accommodated 150 men, and the whole thing was packed in about 4 feet by 3 feet by one foot. It could be put on the top of a wagon, spread out and pegged down, and there you had at once a sleeping place, dry and comfortable, for that number. With such an arrangement of an autocar with a tortoise tent, the soldiers could live, as one of the speakers said, like gipsies. I think they would live a little more comfortably and be a good deal cleaner, but certainly it would be a satisfactory mode of sheltering troops, because the expense, trouble, and annoyance of carrying about a vast number of bell tents in separate wagons are very great, whereas in this case the same vehicle that is carrying the troops also carries the tent with it. That is the reason it is called the tortoise tent: it carries its own cover on its back. As regards what was said about the cavalry, up to now we have always sent the cavalry to the front, and is it not obvious why that was done? The generals sent the troops that could move the fastest to the front, and in the olden days the troops that could move quickest were the cavalry. Therefore they always went to the front; but nowadays the cavalry cannot move nearly so fast as the infantry can move in motor cars; they cannot do a third of the distance in the same time, and therefore I certainly would not send the cavalry by road nowadays. As I say in my paper, I should leave the railway to carry the cavalry, the artillery, the *matériel* of war, and what was necessary for the immediate use of the columns. The cavalry and the artillery should not be allowed to block up and destroy the roads; the roads should be left for the conveyance of the infantry, and should be kept in good order.¹ Mr. Shrapnell Smith, who knows more about these things than most of us do, said that there were registers of motor cars already in existence in this country. That is quite true; but they are not available in the way in which I wish them to be made available. I want the cars to be classified for suitable places and towns in particular districts. You can get all the materials for information out of the existing registers, but these registers would not be satisfactory for the purpose for which the military authorities require them. You must have new registers under the charge of a staff, to which is assigned the duty of organising this mode of military transport and keeping it organised. With regard to the question of fuel, I do not want to say anything against steam, but the chief difficulty is that most autocars are driven by gentlemen who know nothing about steam. The steam vehicle is an excellent vehicle in the hands of a skilled man, but it is the most useless of vehicles in the hands of an ignorant person. A man can learn a good deal about driving an internal-combustion engine in a very short time, but very few men would be capable of learning really efficiently to take charge of and drive a steam

¹ I would add that the cavalry should not be allowed to use the centre of the road, but should move in two ranks close to the edge of the road on each side. There should also be a road mending corps, men hired and working under the regular roadmen and road surveyors. Of course, I am speaking of home defence only.—J.H.A.M.

carriage without a considerable number of months' training. Then it was suggested that a difficulty would occur with regard to the fuel. I do not think so. I think we may be certain that, at the present moment, we have fuel enough in this country to last us for at least a month or six weeks as regards any military operations which we may require, and if at the end of a month or six weeks the business is not finished, we need not trouble ourselves any more about fuel. In that time we should either have driven the enemy off, or else the enemy would have compelled us to make the best terms we could. Therefore there is no fear about that. Then Mr. Shrapnell Smith also said, and I quite agree with him, that it would be a somewhat serious thing to send off a number of London omnibus drivers to drive 'buses containing troops, say, down to Southampton. Yes, but in a national emergency it has to be done. If you send 500 omnibus drivers down to Southampton, you must take the risk of some of them not getting there. Even if fifteen or twenty of them come to grief, you can afford to lose them. The thing has to be done, and you must do the best you can. You must not consider too much the little accidents that may happen. Even if only 250 out of 300 get down safely, it does not matter much what happens to the others; they would be brought on by the next vehicles that came along; and let us hope the casualties that would happen, both of injury and delay, would be very small compared with the casualties that are sure to happen once the enemy gets upon our shores and we have to fight him off. It does not matter whether you get your leg broken in a motor car accident or whether you get a bullet in your leg from an enemy, it all comes to the same thing. You must get the force forward at any risk of some loss in doing so. One train in a smash would kill and injure more soldiers than 20 motor breakdowns. I am exceedingly obliged to you for the way in which this paper has been received. Any amount of labour that I can give to the subject I shall only be too pleased to devote to it. Allow me before I sit down to ask you to give a hearty vote of thanks to Sir Reginald Hennell, who has so kindly presided. He is an old friend of mine, and I feel very much obliged to him for taking the Chair at a moment's notice.