Royal United Services Institution. Journal

Publication details, including instructions for
authors and subscription information:

<http://www.tandfonline.com/loi/rusi19>

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Published online: 11 Sep 2009.

To cite this article: Lieut.-Colonel J. F. Donegan R.A.M.C. (1914) The Uses of
Aeroplanes to the Army Medical Service in the Field, Royal United Services
Journal, 58:433, 321-333, DOI: [10.1080/03071841409423043](https://doi.org/10.1080/03071841409423043)

To link to this article: <http://dx.doi.org/10.1080/03071841409423043>

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THE USES OF AEROPLANES TO THE ARMY MEDICAL SERVICE IN THE FIELD.

By LIEUT.-COLONEL J. F. DONEGAN, R.A.M.C.

On Wednesday, January 14th, 1914.

LIEUT.-GENERAL E. C. BETHUNE, C.V.O., C.B., in the Chair.

THE CHAIRMAN: Ladies and gentlemen, as Chairman it is my privilege to introduce to you the lecturer this afternoon. It may seem strange that an ordinary combatant officer is taking the Chair when a highly-technical subject like this is being discussed, but all I can say is that we in the Army nowadays interlock a good deal more than we used to do I am glad to say, and every military subject interests every military officer. This is essentially a military subject, and I hope that we shall gain from its study to-day. I have had the pleasure of serving with Colonel Donegan in many and varied climates; I know he is a man of originality and a man of brains, and I am certain what he has to say will be of interest, and, I hope, instructive. I trust we shall have a discussion after the lecture which will add to the interest of the paper which is going to be read. I now have great pleasure in introducing Colonel Donegan.

LECTURE.

INTRODUCTION.

LIEUT.-GENERAL BETHUNE and gentlemen, I propose to-day to lecture to you on the subject of Army Medical Aviation.

It is not my intention to say more than I can help on the science of aerial navigation generally, and I hope that any remark I do make on this point will appear to you as bearing on my subject. I may also add that with my very limited experience, I do not for a minute propose to pose as an authority on aerial matters. I have collected a certain amount of information from literature bearing on the subject, and also from conversations with experts, therefore any opinions which I may appear to express are, in addition to my very humble opinion, also the opinions of others who have devoted their time, money, and in one instance, their life, to the subject of aviation.

I am well aware that many are fully imbued with the idea that air machines of any description will never be of any practical use in peace or war to any particular service; the Medical Service least of all.

Such no doubt may be the case, but as regards my own service I can only give you my humble opinion for what it is worth, wishing it to be clearly understood that my suggestions are not for to-day, to-morrow, or the day after. I am only, so to speak, trying to devise some form of clothing which, though quite unsuitable to an infant in arms may still be useful to it in its walking stage.

There are, no doubt, many officers present who, if they had made a bet of £1,000 that the air would remain unconquered during the first 20 years of their service, would have found themselves £1,000 richer. Still, would it, I ask, be in your opinion a wise thing to advise a Sandhurst cadet of to-day to make a wager limiting the possibilities of winged machines, having due regard to the distances which have already been flown? There is little doubt that machines which can turn upside down and right themselves in air, will right themselves in public opinion before many years have elapsed.

I shall now try and enumerate the different components of our aerial fleet with their probable uses to our Medical Service.

BALLOONS AND KITES.

Balloons and kites in the ordinary sense could be of no assistance. Yet a small balloon, little larger than a toy, lit with a dry cell battery, may be a better form of making clear the locality of our hospitals in town and on the lines of communications at night-time than our present two white lamps. Similarly, a red cross kite by day may also be better seen from airships engaged in dropping explosives than a flag.¹

AIRSHIPS.

Airships, as they are at present constituted, both rigid and non-rigid, are, I understand from information received, considered more suited to naval warfare. There are difficulties about landing and housing, to which I shall not allude, also the question of the volume of hydrogen gas required for suspension purposes, which must necessarily limit the number of the crew. In America at present a form of airship has been invented and made in which there is a combined support of wings and a suspension balloon. It is driven by three engines, and has the power of carrying heavy baggage. It is a form of combination between our present airship and a biplane or monoplane, I cannot say which, but judging from its dimensions it

¹ Suggestion intended for cramped space, which would not allow of a flag being pegged out on the ground.

is an airship no matter how supported. The idea may of course come to nothing, but some aerial experts have enough belief in the probable capabilities of the ship to provide the amount of money necessary for its construction. Not long ago, when talking with an expert of experience, he told me that he considered before long airships of this description would be used for the transport of detachments of troops on the field. When that is possible I have little doubt that they will be available for removal of wounded able to sit up, having due regard for the rapidity with which they could act, as compared with vehicles confined to roads, and also the fact that they could proceed regardless of roads, bridges; neither should they hamper or delay troops moving in a different direction. Provided with the required amount of stability, they would be equally useful in savage as well as European warfare.

MONO, BI, AND WATER PLANES.

My remarks on mono, bi, and water planes are common to all, with due regard to their carrying and lifting capacity.

USES TO MEDICAL SERVICES.

Scouting.

1. *Scouting for Wounded on the Battle-Field.*—As regards this point, I am indebted to Captain E. G. R. Lithgow, R.A.M.C., an officer who holds a flying certificate, and also to Doctor Raymond, a member of my profession, an aviator of great experience and a member of the French Senate. Both these gentlemen have said respectively in the August and September editions of the *R.A.M.C. Journal* that aeroplanes could be used for this purpose.

Personally, if I may say so, I cannot at present realize their element of utility, but I am only too willing to be convinced. From my humble experiences of war I have never found it particularly difficult to locate wounded by day, but very difficult at night-time. I presume that if aeroplanes are likely to be of use at night in this respect it should be presumed that they are fitted with a search light and wireless telegraphy installations, but the rate at which they travel is, to my mind, likely to be misleading. Distances in miles are quite accurate enough in many instances for marching troops, but when it comes to the question of the helpless and disabled even yards count.

Simplification of Duties of Administrative Officers.

2. In the second place, it is possible that at some future date aerial transport will simplify the duties of Administrative Medical Officers on the field. As you know, at present medical officers are regimentally attached to the different fighting units

of a force at the rate of one per battalion. A cavalry regiment also has one medical officer, but it is likely on occasion to divide into squadrons, and then there is an element of luck whether the medical officer is with the squadron which has had the largest number of casualties or not. Were an Administrative Medical Officer to be absolutely certain that one brigade in war was to meet with very severe opposition, and that another brigade was certain not to be engaged, it is rational to suppose that he would augment the number of medical officers with one even at the expense of the other. It is Utopian to imagine that there could be certainty in war on such a point, the best that one could expect would be the operation orders of the G.O.C. as to likelihood. With aerial transport a distance of 20 miles is, roughly, only a matter of so many minutes, therefore were aerial transport available an organizing medical officer could, so to speak, wait and see, and then provide medical assistance, both regimental and field ambulance, where it was absolutely required. If he was in the position of being able to provide medical assistance in so short a time at any given spot, the difficulty of providing for suddenly detached parties would be greatly simplified, and perhaps the present system of regimental attachment of medical officers could be somewhat modified.

Specialists.

3. At present we specialize in peace time, and I am sure no one will object to a proposal if practicable to give the soldier wounded in war the same advantages as in peace. Were aerial transport available the services of our operating surgeon or any other specialist could be obtained even though he be at a clearing station or even general hospitals. It is quite rational for anyone to ask how an operating surgeon who is expected to operate in our hospitals could also be available for professional assistance in the field, as he cannot be in two places at one time. Aerial transport, so to speak, almost renders that possible. It would certainly be possible for a specialist to do a primary operation in the field on some sufferer, and also to be waiting to receive him on his arrival at hospital, having due regard to the rate the wounded man would travel as compared with an aeroplane. The services of specialists could even be provided to towns under siege conditions.

Increasing the Number of Medical Staff.

4. From what I have said under my second heading, it can be realized that the medical service can be rapidly reinforced and that anyone specially wanted, from a carpenter to an operating surgeon, can be despatched.

Inspections.

5. I am sure that all those capable to judge will agree that no written reports on the condition of affairs existing under

service conditions can compare with personal observation. When an Administrative Medical Officer receives notification in the field as to what is and what is not possible as regards disposal of wounded or any other question he, were aerial transport available, would be able to fly, see for himself and help with his maturer judgment.¹

Reduction of Correspondence.

6. In like manner it is easy to imagine how the numbers of helio, telephone, and telegraph messages in the field could be reduced were such means of communication available. In fact it is rational to presume that an officer who desired to ask 12 different questions requiring 12 different answers may deem it more advisable to fly to the position, get his questions answered verbally, and in that way save all correspondence on the point.

Providing Surgical Assistance.

7. On July 23rd, I lectured on this subject to the British Medical Association, producing for inspection a means of conveyance of an operating table with all surgical contents, of which I propose to show you lantern slides.

The late Colonel Cody was very deeply interested in the subject indeed, and from experiments made with both his machines, which I deeply regret to say came to grief, he and others were confident that it was perfectly possible to carry for long distances the equipment and three officers, in addition to the pilot, an operator, an assistant, and an anæsthetist. No very exhaustive or prolonged trials were made, but the idea was, to devote the machine in which he met his death, to lengthy trial after the all round Britain race. It was even proposed to give a demonstration at manœuvres of what could be done in this respect, but unfortunately the fates decreed otherwise. When I first approached the late Colonel Cody, he appeared to realize at once that there was something in the suggestion, as his sympathies, I can assure you, were with the wounded soldier, and he was fully imbued with the desire to do all he could for his assistance. I well remember his jocular remark when he first saw all the surgical instruments contained in the operating table: "There is so much steel, it may interfere with the ignition; I don't want any of those things used on me." It is sad to have to relate that within a very short time he was beyond the aid of instruments of any description.

Since his lamented death I have been in correspondence with Mr. Grahame White, and he informs me that there would be no question of difficulty in carrying three officers and a pilot

¹ I believe Maurice Farman machines, which can land on cramped and indifferent ground are at present available; they could be used for this purpose.

in his 120 horse-power five-seater biplane. The machine has a lifting power of 1,400lbs., and has actually flown with as many as ten passengers at Hendon. As the operating table was required for inspection at the War Office, no experiments in this machine have yet been carried out, but I feel sure that there is no element of impossibility existing.

As regards the conditions under which an operating table and a surgical staff would be required in the field, I am fully aware of the fact that it is highly undesirable to operate under such conditions if so doing can possibly be avoided. Still, no one can say that the conditions may not arise when operating in the field becomes necessary.

In our war games and staff rides we, on occasions, are compelled to leave wounded so severely injured that they cannot be moved, to be surgically treated by the opposing force and red cross and voluntary aid societies. It is not unnatural to presume that under such conditions, surgical operations may be necessary.

It is also quite possible that there may not be any medical assistance in the exact locality of the wounded, and that the medical officer of a voluntary aid society may be an ordinary general practitioner who would not relish the idea of doing numerous complicated surgical operations. There are numerous other positions where surgical operations, though undesirable, may still be necessary, and the idea is, to try and render the best assistance to the wounded with the least inconvenience to the force to which he belongs. With aerial transport it would be possible to relieve opponents of the duty of the pure, simple, primary operations, having them done instead by surgeons of the same nationality as the wounded man, who could be subsequently handed over to voluntary aid societies for further treatment.

I do not propose to utilize aeroplanes purely for the medical service, but simply to work with any aeroplane not required for other and more important duty. Neither do I advocate that the medical officer should be obliged to have any knowledge whatever of aviation; the proposal is that he be simply a passenger conveyed by air instead of motor or train, when technical knowledge of his mode of transport is not considered essential.

FEASIBILITY OF PROPOSAL.

Having said what I consider to be possible, it is perhaps better to make a few remarks on the feasibility of the suggestion. In the first place, as I have said, my proposals are not for to-day or to-morrow. It is quite time enough to consider this matter seriously when we are in possession of machines with the lifting power necessary to convey three officers in addition to the pilot, provided that they are not at present available or in the course

of construction.¹ There are many officers of experience also of the opinion that in war aeroplanes will not be available for this purpose. Others also consider that on account of difficulties of night flying and the influences of wind the idea is impracticable.

In the first place wind, and fog at times, even interfere with our marine fleet, and it pertains more to aviation generally, than to my humble proposal. As regards darkness, it affects the rising and landing more than the actual flight. Now that explosive torches have been invented which enable the pilot to discriminate between land and water, confined and open ground, to say nothing of the possibility of electric light installation similar to motor cars, it is quite probable that the difficulty will be overcome.

As regards the former objections, I take the liberty of referring to the result of the French manoeuvres of this year, subject of course to correction from military experts who naturally know far more about this subject than I do. From what I have been informed, I understand that at these manoeuvres aeroplane reconnaissances were found to be not reliable as regards detail, so they had to be subsequently confirmed by reconnaissances by cavalry. It appears to have been realized that the pilot had enough to do to keep the machine in the air, and that one observer was not enough to deal with the different branches having due regard to the pace at which the plane travelled. I believe the present proposal is, to work with aeroplanes capable of carrying three officers in addition to the pilot, to observe the doings of cavalry, artillery, and infantry. No doubt a gunner could locate guns from reasons best known to himself, better than any other branch. I also understand that officers of different branches are being trained as observers only, having nothing to do with the mechanical working of the machine. I take it that after a course of instruction at different elevations they are expected to discriminate the difference existing between a bull and a china shop. I regret to say that as far as my very limited experience goes, I failed absolutely in this respect. I made out the china shop in a way, but my bull happened to be a cow-shed in a field over 30 feet long. As regards the probability of aeroplanes being otherwise engaged for military purposes, I am also informed that their value as regards supplying information at the same manoeuvres was of more account some days before and immediately before hostilities commenced, than during an actual battle or afterwards. It is after an engagement that aerial transport would be most useful to a medical service; so perhaps there is the remote chance that those of the required capacity may be so utilized when not otherwise required.

¹ As a matter of fact two medical officers would do instead of three, and I understand that in our Flying Corps there are already machines capable of carrying the surgical equipment, two officers and the pilot.

There is of course the question of opposing forces objecting to aeroplanes engaged in medical work flying over their positions. Perhaps the matter could be arranged amicably, but if not, I believe a high artillery expert, Lieut.-General Sir James Grierson, K.C.B., has stated that at 3,000 feet an aeroplane would be nearly impossible to hit. Therefore, all an aeroplane so engaged would have to do would be to steer more in the direction of Heaven.

Then there is the question of danger, which, though minimized by care and experience on the part of the pilot, will always remain. After all war is all risk, and I do not think that under war conditions any officer of the R.A.M.C. would question his mode of transport provided his goal was assistance to a disabled comrade. As regards the opinion of medical experts, I may add, that I was indeed gratified to read in our corps journal, subsequent to my lecture at Brighton, the opinions of Captain Lithgow and Doctor Raymond on the subject of aviation generally.

Captain Lithgow says :—

“ Air crafts have now become so reliable that it is quite practicable to have machines fitted to carry medical and surgical equipment and to treat the wounded on the spot.”

That I look on as support of my seventh proposal—Providing Surgical Assistance.

Doctor Raymond says :—

“ Aeroplanes can be used for the purpose of providing medical assistance to outposts, and as a means of communication between a director of medical services and others.”

That statement from such an expert I look on as supporting propositions made in suggestions No. 5 and No. 7. I wish to thank Surgeon-General W. W. Kenny, K.H.S., F.R.C.S., for his most valuable support and assistance, he being the first General Officer of my acquaintance to realize that aerial transport may be of assistance to the wounded. I also offer to Major J. F. A. Higgins, D.S.O., Royal Flying Corps, my sincere thanks for his most valuable suggestions and criticisms. I am exceedingly gratified to see that the members of the R.F.C., like other flying men that I happen to know, are absolutely practical in their ideas. Instead of confining themselves to observation and bomb throwing only, they are, as far as I can judge, only too willing to be of any use they can to an army in the field.

I will now show you some lantern pictures of this aero operating table, made by the firm of Arnold & Sons, Giltspur Street, London.

I must apologize for any remarks which I have made which may be considered facetious, which I can assure you were only made to relieve monotony, which may not have existed were the

matter under consideration in the hands of one more capable. My remarks are intended only as a suggestion, leaving it to wiser heads than mine to discard the chaff and retain the wheat (if any).

I also feel sure any suggestions intended for the benefit of our wounded in war, if considered in any way practical, will not be received with deaf ears by our gallant Chairman, who I sincerely thank for presiding at this lecture, or by any General Officer in our Army.

DISCUSSION.

Col. H. S. Massy, C.B.: By a piece of good fortune I happened accidentally this morning on going over some files in the Aerial League Office to come across a portion of a paper written by Mr. T. F. Farman, the celebrated French aviation writer, which bears very directly upon the subject of this lecture. He says: "If increased carrying capacity is required for fighting avions, it is also important for the aeroplanes it is proposed to employ in the sanitary service of the Army. Till now the French military authorities have not adopted any of the various projects submitted to them with that object in view, but they facilitated the experiments made by Doctor Reymond during the French autumn manœuvres. The Senator aviator belonging to the Territorial Army was authorized to use his aeroplane to seek the wounded on the field of battle. Groups of men and isolated soldiers had been left to represent them. Some were clustered together under trees, others were hidden behind hedges, etc., but Doctor Reymond succeeded in discovering them all. . . . The result of the experiment was so encouraging that the Minister of War, knowing well that so many brave wounded men are often left on the battlefield for many hours, and sometimes for days, before they are discovered by the medical exploring parties, is, with the Chief of the Military Sanitary Service, studying the question of a flying search corps which would, almost immediately after the fighting, indicate to the Ambulance Corps the exact spots where the wounded are lying. On its side the French Red Cross Society is examining the project submitted to it by Major Perret of the 99th Regiment of Infantry, for the utilization of aeroplanes in the evacuation of at least the most seriously wounded soldiers. Major Perret does not propose to send aeroplanes to the battlefield, but to hold them in readiness at the field ambulances. It is only after their wounds have been summarily dressed that he would place the men on aeroplanes which could transport them rapidly and without any sort of jolting to hospitals in the rear, where they could be at once properly attended to. He contends that many valuable lives would be thus saved. Some of the most capable aeroplane constructors have assured Major Perret they could build machines to transport four wounded men in a lying position. That being the case, and as the ordinary ambulance wagon does not travel at an average of more than four miles an hour under favourable conditions, Major Perret calculates that one aeroplane could do the work of several ambulance cars, even were they automobiles. Moreover, the wounded men would be spared the long and painful journey, often lasting many hours. Indeed, in half an hour an aeroplane carrying four wounded soldiers could cover a distance of at least 25 miles, whereas an ordinary ambulance wagon conveying the same number of men in the same lying

position would take about six hours! Allowing half an hour for unloading, etc., the aeroplane could make the voyage five times, and transport 20 wounded men in the time the ordinary ambulance car would occupy in transporting its first load of four soldiers! The ambulance car would then occupy another five hours to return for a second batch of wounded. The French Red Cross Society has promised to assist Major Perret in making a practical demonstration of his project." I may say, Sir, that the Executive Committee of the Aerial League are now in communication with Doctor Reymond, Major Perret and Doctor René Quinton, the President of the French Aerial League (who is the famous inventor of the salt water cure), for further particulars on the subject of how far the French Army have progressed in these matters, and I should like to tell the lecturer that at the earliest possible moment, as soon as we receive any fresh information, it shall be placed at his disposal.

Brigadier-General F. G. Stone: Mr. Chairman and gentlemen, I am far from wishing to throw cold water upon this admirable project; on the other hand, I quite sympathise with the lecturer's views that he is not speaking necessarily for to-day or for to-morrow, but that is no reason why he should not be speaking for the next day. The last speaker has referred to some experiments which were carried out during the last French manoeuvres which I read myself with very great interest, and had intended to allude to to-day if they had not already been brought to your notice. There is one thing which I think the lecturer is unduly sanguine about, and that is the availability of a sufficient number of aeroplanes for carrying out the duties which he has so admirably and clearly depicted. The lecturer says he believes that the aeroplanes that are used in the service of the Army generally for combatant and scouting purposes, will be used principally before an engagement. Possibly that may be so, but I venture to think that a very considerable number will also be required during the engagement and after the engagement. An engagement nowadays may last for three or four days very easily; one can hardly cut it down to the limits of one day, as one used to in the days when I was a cadet. Apart from that fact, assuming that a small number of aeroplanes were available at the end of a day's engagement, I think it is very likely indeed that those would be required to be put in reserve to replace the casualties to material which would inevitably have occurred, both from wear and tear and from being in action during the day. I would rather advocate myself, if I may use a vulgar expression, going the whole hog, and, when the authorities consider that the science of aviation has reached a point where the medical service assisted by aeroplanes is practical politics, that the field ambulances should be supplied with such a quota of aeroplanes as might be considered necessary: in other words, that they should form part of the Army establishments. I think it would be extremely dangerous and very unsatisfactory for the medical service to rely in any way upon aeroplanes from other sources being available when they were required. If we are to count upon and to organize this service in the way it should be organized to be of practical value, I think the administrative medical officer must have absolute control of everything under his own hand. If he cannot, I think he had better not trust to it at all. Another very important point is in reconnoitring the field of battle with the object of discovering the wounded. We might not at all improbably find ourselves up against the outposts of the enemy. The aeroplane that was in use might be painted

with a big red cross or with anything else you like, but I am very doubtful whether it is practical politics to believe that any aeroplane, no matter how much it was painted with red crosses, would be allowed by an enemy to approach anywhere within the proximity of his lines. At all events, to get such a thing undertaken it would be absolutely necessary for the whole question to be considered by the Hague Conference, and get exact rules laid down under which aeroplanes for that purpose might be employed. Perhaps it would be a little over-sanguine to expect very much result from that point of view, as it is so obvious that an aeroplane purporting to be used in the service of the wounded might quite possibly be also used, either purposely or incidentally, to gain very valuable information; and I do not believe that any army in the field would take the slightest risk on that score simply for the sake of the enemy's wounded, no matter how humane that enemy might be. But still, as I say, that is a question rather for the Hague Conference than for us to consider. Another point in which I think the lecturer was a little over-sanguine was as regards 3,000 feet high being the safe limit within which an aeroplane is not likely to be hit. All our most recent experiences show that 4,000 feet is the minimum limit at which you can fly during action without the certainty of being hit. I will not weary you by quoting instances, but I think those who have followed the subject fairly closely will agree with me that the 4,000 feet limit has been established beyond doubt, both with regard to shrapnel fire and bullets.

Major J. F. A. Higgins, D.S.O.: I do not quite agree with General Stone in what he said about aeroplanes being allocated to the R.A.M.C. I think that, as the lecturer says, after an engagement the aeroplanes will not be wanted so much, and there is a great possibility of some machines being available for the purposes that the lecturer has alluded to. The Flying Corps understand now, I think, that one use of a machine in war is to convey staff officers from one place to another. The advantages of that are that you obviate the difficulty of motors going along bad roads that are blocked by troops, transport and all that sort of thing. It would only be for comparatively long distances that you would use this means of transport, but I think it is getting generally understood that machines would be often wanted to convey staff officers in this way. The case of an administrative medical officer wishing to go and see how matters were for himself falls under this heading. As the lecturer said, we have now at the present moment in the Flying Corps machines that can land in bad country and small fields. They are not very fast machines, but they are considerably faster than a motor; they can do upwards of 50 miles an hour. I think I might add that we hope before long to get machines considerably faster than these that can also land in small fields. Then as regards the conveyance of specialists and of operating tables, I do not think that in the Flying Corps there are any machines that could take three people besides the pilot and the operating table, but there are machines that could certainly take two. The extra weight of 93 lbs. would not be very serious, as I do not myself see much scope for aeroplanes in the matter of looking for wounded on the battlefield. The lecturer himself said that he never found it particularly difficult to find the wounded by daylight, and I do not think it would be possible for aeroplanes to help by night, even with a searchlight. It would perhaps be possible for an airship to help by night by hovering over a particular

area and lighting it up with a searchlight, but I do not think an aeroplane, certainly an aeroplane at the present moment, would be very much good. As regards the question of the influence of weather on flying generally. The objections that Colonel Donegan spoke of do not apply so much now as they did a year ago, and very likely in the future they will apply less. As an instance, before last summer, certainly in a country like England, people used to think that flying in a hot sun was dangerous, but I think we found last year that it is quite safe though it may be rather uncomfortable. There is much more protection from the weather given to the pilot now, and that has made flying in rain quite feasible too. Thick fog is still a difficulty, and flying by night, or rather landing in an unknown country by night, is certainly very hazardous at present. I have no doubt that in the future—perhaps in the immediate future—by means of electric light installations and a searchlight we may be able to get over this difficulty, but I do not think that on the whole generals would like to risk their machines at night for purely medical purposes. In my opinion nearly all the proposals in the lecture are quite practicable even now, and in the immediate future will be even more so.

Lieut.-Colonel Donegan, in reply said: In reference to General Stone's remarks, I thoroughly agree with him, but really my idea in using the aeroplanes as they exist at the present moment instead of establishing them as part of the medical unit was that I thought at the present stage it would be a bit too big an undertaking to carry out the latter suggestion—as regards going the whole hog. Nobody would object to having them if they could get them; but still, I am bound to say from experience in the field, which anybody who has any idea of mobilization in the field will confirm, that if one gets hold of a thing they probably get rather selfish about it. It would be just like what happened in regard to the wagons in South Africa, where we were not willing to lend our transport. Once we got hold of it we kept it. On the other hand, I thought if we concentrated our aeroplanes under the Royal Flying Corps as we concentrated our transport, it would be better only to use them for medical purposes when they are not required for other and more important duties. With that idea in sight, when I invented the aero operating table, which you have seen, I made it suitable for transport on any form of aerial machine.

The Chairman: Ladies and gentlemen, in my humble opinion Colonel Donegan has made out a very good case for his proposals. There is no doubt about it, as everybody who has had charge of troops in the field knows, that the non-effective services, so to speak, worry him a great deal more than his effective services. He has to have one eye on his front, one eye on his rear, and he has to think of his wounded and his communications. This proposal will do in the cause of humanity a great deal of good to the wounded, and it will also have the advantage of clearing the roads of a certain amount of traffic which is not absolutely connected with fighting troops. So far, I am entirely with the lecturer. Consider for a moment how far we have gone in the last few years. I can remember when I was a boy reading Jules Verne's stories; I thought they were most interesting, exciting and charming, but that the ideas contained in them would never come to anything. But nearly all the ideas in Jules Verne's books have been realized at the present time, and even some of the ideas in Mr. Well's books have been realized, and probably will be

further realized in the immediate future. Some of them have already come true. To my mind, the only point is, are we going to have enough aeroplanes? I made a note to mention a point that General Stone has dealt with, namely, that if you are going to have your aeroplanes for this particular service they ought to be earmarked for it beforehand. It is all very well to say that once the troops are engaged in battle you do not want to make a reconnaissance. As a General Officer commanding troops, I personally would like to feel that I could still carry out a reconnaissance if I wanted to do so. You must remember that nowadays battles extend over a front of possibly 20 miles, and there may be large turning movements taking place on one side or the other which I may like to know something about during the engagement, and it might be quite necessary to send out the aeroplanes to make a reconnaissance. So that I really do think if we are going to make this a practical thing we must have enough aeroplanes of the proper type to make it possible to be able to supply both Services. But there, as Colonel Donegan has several times reiterated in his paper, we are not talking for to-day or for to-morrow. I am perfectly certain that the ideas which he has formulated to-day are practicable, and will give food for thought in many directions, even beyond the actual scope that he has taken for his paper to-day. You must remember that Colonel Donegan is an officer who has practical experience of warfare, so that he knows exactly what he is talking about; he is not a theorist, so that any thing he says is worthy of very great thought. They are well worthy of the reception that you have given to him to-day. It is no use saying a thing cannot be done. If a thing can be done it has jolly well got to be done if we put our hearts into it, and if we work on the right ideas. We must go on jamming along until we get what we want. From a military and medical point of view his ideas are thoroughly sound. Whether they are visionary at this particular moment is a matter for the idiosyncrasy of the individual. Some of us with the light of imagination can see further than others; others can only see exactly what is before them. Anyhow, several valuable ideas have been excellently put before us to-day, and we are very grateful to Colonel Donegan for his lecture. I should like to remind you of the words of a wise man, though I cannot remember who the wise man was, who said "*Credo quia impossibile*"—"I believe because it is impossible." That is absolutely true of so many things. A thing is going to be if it is any way possible. And even if it is impossible, it must also be true, because the very fact of its being impossible to-day is almost a guarantee that, in the present state of the intellect of man, it will be the possibility of to-morrow, and the common-place of the day after to-morrow.

In your name, ladies and gentlemen, I accord Colonel Donegan your very hearty thanks for the way in which he has placed his views before us.

Lieut.-Colonel Donegan: Ladies and gentlemen, I thank you most sincerely for the way you have listened to me. It has been a great pleasure to me to-day to lay my views before such a capable and appreciative audience.

The Secretary (Lieut.-Colonel Sir Arthur Leetham): Ladies and gentlemen, I ask you to accord the Chairman a hearty vote of thanks for coming and presiding over this meeting.

The resolution was carried by acclamation, and the meeting terminated.