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Dentistry in the field – a mobile dental laboratory during World War II

During World War II, mobile dental units were vital to the health of troops in the field. In this article, Air Commodore Freddy Hulm presents a talk originally given by his uncle, Major Alastair Robertson, to the Eastman Institute in Brussels in 1944. It provides a fascinating first-hand account of life and work in a field dental laboratory during the Second World War.

My uncle, Alastair Robertson, served in the Army Dental Corps throughout the war. With a particular interest in prosthetics he found himself, in 1944, in command of one of the Field Dental Laboratories that accompanied the army on the invasion of Europe. My aunt, now in her nineties, sent me this copy of his notes prepared for a talk he gave at the Eastman Dental Clinic in Brussels. I felt that what he had to say, and how he came to be there, would be of some interest, particularly to those few left who served at that time in what is now the Royal Army Dental Corps.

My uncle was a charming and charismatic man, much loved by all and certainly by me, indeed it was his example that led me into dentistry. To be in charge of a Field Dental Laboratory must have been just his scene, he would certainly have enjoyed the challenge and how well he did was recognised by a Mention in Despatches. Shortly after D Day he landed in Normandy with his unit and for four months they followed the advance until they reached Brussels where, on the relief of the city, he took over the Eastman Dental Clinic which had been vacated so recently by the Germans.

These notes were made for a talk and not for publication but I have left them much as they were, as they do so bring to life his experiences at that time. They were written in English but it is apparent that at least some of his talk was delivered in French so perhaps he did have a French translation prepared. Perhaps first I should provide some background on the need for these Mobile Field Laboratories and their equipment, but I do

this with some temerity as I am much aware that there will be some around who served in France, even with my uncle, and who could paint a far better picture.

Prior to the Boer War, dental care was just part of the task for the surgeons in the Army and Navy. Mostly they could do little more than remove teeth, lance abscesses and paint ulcerated gingivae, but no more was expected. However, while the huge increase in sugar consumption throughout the 18th and 19th centuries led to dramatic increases in dental caries, advances in dentistry were offering increasingly effective means of restoration. Following the Dentists Act of 1878 and the formation of the British Dental Association, some pressure was put upon the medical establishments of the Army and the Navy to improve the dental care of their men, but it was many years before the need was recognised. Dental disease was not then considered a problem by commanders, who were quite used to the steady attrition of their forces by endemic disease and who were concerned far more about epidemics, such as cholera, typhus or Yellow Fever, that could decimate an army or the crew of a ship.

Little was done until dental disease was seen to have distinct military significance. As it was the Crimean War that showed the Army to be so ill-prepared in matters of hygiene and nursing, so it was the Boer War that was to demonstrate the total inadequacy of arrangements for dental treatment. Throughout this war the army had an average of 208,300 men in South Africa but of these, 6,942 had to be admitted to hospital

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for dental reasons and about one third of these had to be sent back to the UK.

Now the problem was recognised, but it took a few more years for something to be done about it. There was much talk and various measures were adopted but, in August 1914, the British Expeditionary Force arrived in France without a single dentist. Also there were no dentists accompanying the force landed in Gallipoli in April 1915. To quote from a history of this campaign, ‘...dental disease had become widespread and was the source of much stress and a considerable amount of disability: by the end of July, from the First Australian Infantry Division alone, 600 cases had been evacuated for this cause.’

Now urgent measures had to be taken and dental officers were enlisted to join the medical services throughout the rest of the war. Subsequently, in 1920, the Royal Navy Dental Branch was formed and in 1921 The Army Dental Corps. Dental treatment for the RAF was provided by the Army Dental Corps until the RAF Dental Branch was formed in 1930.

At the start of the Second World War, additional dental officers were recruited in considerable numbers. Most were established on the larger bases or ships but all three services used mobile units in caravans to look after their smaller and more remote formations. Overseas and in the field, the use of caravans was often restricted by the terrain. Initially much depended upon local initiative, but in most cases the mobile

units were supplied with field kits carried in panniers and they operated under canvas. Later, the RAF was fortunate to be equipped with prime mover mobile units: large Fordson trucks that operated in North Africa and Europe. Some prime movers were presented or lent to the Army but the War Office resisted the call for such equipment and the mobile units accompanying the invasion force continued to operate under canvas or in whatever accommodation they could find (Fig. 1).

So came the invasion of Europe and my uncle's involvement. The invasion force was equipped with one mobile dental unit for each armoured division, two for each infantry division and three for each corps. Working and living under canvas, each unit comprised a dental officer, a dental clerk/assistant, a dental technician and a driver with a three-ton truck. The Field Laboratories, as described here by my uncle, were established at one for each army corps (Fig. 2).

After the war my uncle set up in practice in Blundellsands near Liverpool, where he remained until, sadly, he died in 1961. Hepatitis that he contracted during the war was held to be the cause of his early death.

The history of dental services in the armed forces is quite a tale, particularly on the development and deployment of the mobile dental units. Histories of the dental services in each of the armed forces may be found in the BDA library for those who would like to delve a bit deeper.

FIELD DENTAL LABORATORIES OF THE ARMY DENTAL CORPS IN THE FIELD

Major A. C. Robertson, No. 54 Field Dental Laboratory, B.L.A.

Given at the George Eastman Institute, Brussels, on 21st October 1944

‘This is not a lecture on prosthetics as we, in times of peace, would regard such a subject but it is an endeavour of mine to illustrate to you prosthetic dentistry as we practice it in the field, treating an army designed for rapid advancement. Therefore we must also be rapid with our treatment. You might quite possibly, and rightly, compare our treatment with that of our German counterparts who practised here in Brussels but it must be realised that the Germans were in Brussels for four years and, I presume, thought they would be here for many more years. In consequence, as captured German equipment has shown, it was such as to give them carte blanche in prosthetic dentistry but from the point of view of mobility, it was quite impracticable.

‘I command a field laboratory and, even though at the present

time I am fortunate enough to have the palatial and well-furnished accommodation I have at this Eastman Dental Clinic, in the main the instruments and materials used are the same as I used under canvas in Normandy. In effect, the only difference being more comfortable working conditions.

‘It might be of interest to you ladies and gentlemen to know of our working conditions in Normandy.

‘When we arrived there was a large concentration of troops at a place I shall call X for reasons of security and my unit was brought from the United Kingdom for their prosthetic treatment. The site where I, for practical reasons, placed my unit was eight miles behind the line. It sounds a long way ladies and gentlemen but I assure you we thought it too near for comfort, particularly at night.

“Working conditions were anything but ideal. When it rained, as rain it did, the ground became so waterlogged that anything dropped, might quite easily be lost forever.”



Fig. 1 Dental mechanics at work, Mareth Line, December 1943. Image courtesy of the Army Medical Services Museum



Fig. 2 Dental technicians at work in a field laboratory. Image courtesy of the Army Medical Services Museum

‘For a laboratory I had a marquee and for a surgery a tent of 160 lbs. The soldiers slept in two similar tents, one for the privates and one for the NCOs. I had the luxury of my own tent.

‘Owing to the frequency of aerial bombardment by the Hun [sic] it was a regulation that we slept in ‘foxholes’ under our tents. Besides giving good protection from bombing, we soon found that all the small animals that bite most must have thought the same and ultimately it became a question of the lesser of two evils. I must admit that for myself I had good faith in the inaccuracy of German bombing.

‘Working conditions were anything but ideal. When it rained, as rain it did, the ground became so waterlogged that anything dropped, even as large as a denture, might quite easily be lost forever. When it was hot, as hot it was, we often had to remove the sides of the marquee. We were then literally consumed in dust and it was necessary to keep sheets of wax ready for use immersed in water to prevent them from melting. The water had to be carried in Jerry cans daily from a pump almost half a kilometre away and this was used for all purposes. Even in the shade it became so hot at times that it was ideal for shaving but very awkward for casting Plaster of Paris.

‘In Normandy we certainly were not worried by the electricity being cut off as we used pressure lamps, which were quite good but were a great strain on the eyes when used consistently. I did



Fig. 3 Kallodont sticks and denture. Image courtesy of the British Dental Association Museum

“When space is cramped my mechanics work in teams of two so that only one mechanic at a time need be at the plaster bench.”

find one or two tank batteries which we soon had supplying us with a little extra light. They also supplied the current for small electric motors removed from the broken down German tanks and these we fitted with small carborundum wheels for grinding. For ‘boiling out’ water was heated in a large drum by small petrol stove and drawn off by siphon.

‘Conditions, although not ideal, did not prevent us from making 450 dentures in our first four weeks. Many men, because of the turbulent conditions on the Channel, had parted from their dentures and others, because of the particularly solid form of the army biscuit, soon found life almost unbearable without the necessary means of mastication. Men who had been fortunate enough to retain their dentures at sea too often fractured them trying to masticate the almost unbreakable biscuits and this caused us a lot of work. Also, prior to the invasion and for obvious reasons, those men who out of necessity had to have their teeth removed, were fitted with immediate dentures and, on our arrival, many of these had become sufficiently loose to warrant renewal.

‘In toto I have eight mechanics, including a Staff Sergeant and a Corporal. On the clerical side I have a Sergeant who is responsible for all documentation, making appointments etc; also I have a Surgery Orderly and a General Duty Orderly. In effect it is a team and I am pleased to say we have the team spirit.

‘As I have said before ladies and gentlemen, rapid construction of many dentures is essential and since I commenced operating with my unit I have pursued the following routine.

‘When space is cramped my mechanics work in teams of two so that only one mechanic at a time need be at the plaster bench. In brief, it is minor mass production. When working space is good, as we are so fortunate to have here, every mechanic completes his own case from start to finish. Daily, when we are busy, as has been the case since we started, every mechanic is given three impressions for casting, three bites for set-up and three ‘trys’ for finishing. In consequence each mechanic can see what he has to do during his day and I insist, unless some extremely urgent work comes in, that he does nothing more. I have given very careful thought and practice to the number of cases to be allocated in each stage and I have found this is commensurate with good work. So I know almost exactly how much work can be accomplished and it is a simple matter detailing patients for treatment.

‘As Officer Commanding a British Field Dental Laboratory I specialise in denture construction. Before coming to my unit patients have all the necessary fillings and extractions completed and all teeth well scaled at Field Dental Centres. However, I am not entirely dependent upon them as I have also a field dental outfit though, owing to the very close cooperation I have had so far, it is almost brand new. Here in Brussels, where there appears to be a large number of troops, it is very



Fig. 4 Aurora Vitype porcelain teeth. Image courtesy of the British Dental Association Museum

convenient having a large Dental Centre operating together with us in the same building. The liaison between centres and laboratories must be very close. However, where, because of distance, it is not practicable for patients to visit a laboratory, they attend the nearest Dental Centre where all the chairside work is done: impressions, bites, trys and finishes. When this is the case my Duty Orderly acts as carrier between these outlying centres and the laboratory using our motorcycle.

‘Rapidity of construction, as I have already mentioned, is very important. Many cases are completed in a day but if we know that in all probability a soldier is remaining in one place for a week we do complete the case in that time. However, if a soldier is to leave his location before completion of his

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denture, he is given a proforma notifying him to report to his CO who arranges the transfer of the partially completed denture to another laboratory nearer to him.

‘To minimise unnecessary discomfort to a soldier we frequently construct dentures prior to extraction. As a matter of fact one is being processed now for a Colonel. I am to remove his teeth tomorrow, fit the dentures and I hope his routine will not be impaired.

‘The movement of a laboratory is entirely dependent upon the location of the troops. As far as I know, Staff Officers might have decided already that a new concentration of troops requires the more urgent service of my unit, in which case we are organised to move within a few hours with all our equipment. I require two three-ton lorries for movement and, on arrival at a destination, the Unit can start production, as we have done, within three hours. Every man has his own particular task. Proof of this was one movement order we received at 0100 hours in the morning and we were ready to move at 0500. This included striking all the tents and loading the lorries.

‘Even though we are here, and hope to be here for some time, periodically every man is reminded of his own particular task so that there will be no hitch should we have to move at short notice.

‘In the surgery I cannot afford to waste time unnecessarily as each day I see as many as 60 patients and sometimes more. For straightforward partial cases, with no great undercutting, I use Plaster of Paris, which I also use for all edentulous cases. For the big majority of partial cases I use ordinary composition. This latter can be very good when you know it. I lightly smear a thin film of Vaseline over the not too softly heated composition, insert it into the mouth and remove it in about

thirty seconds. The answer is the models are good and so is the fit. At our home stations we use Zelex but, as the number of impressions taken by our unit in the field approaches 200 per week, the bulk of this material would be too much for normal carriage. For full dentures and upper partials we use ‘Kallodent’ [Fig. 3] but for lower small partials we use rubber. This is because the greater resilience of the rubber stands up better to clumsy handling by the patient than does Kallodent. This has been quite noticeable in the number of lower partial dentures received for repair.

‘Cases with a close bite we sometimes back and tag but I do prefer acrylic dentine for the greater number of these cases. The teeth we use are, in the main, Aurora Vitype [Fig. 4] and I do not think we have had more than three or four teeth broken during processing. Spring bands give a more gentle pressure and tend to reduce porosity, but careful pressure with an ordinary press has given us no trouble and one is more certain that the flask is closed. We use sodium silicate as a separating medium but I prefer polyvinyl chloride which I hope to receive soon. Sodium silicate, when a mechanic is in a hurry, too frequently leaves white specks in the acrylic with resultant weakening.

‘However, this is not a scientific dissertation on our construction of dentures but just an endeavour, at short notice, and in a very difficult language, to give you ladies and gentlemen a small account of our work in the field. I have several dentures for you to look at later but please be careful for tomorrow they will be fitted. Also I have here a bridge and two crowns, one a dowel and the other a jacket in acrylic resin made by my corporal as a demonstration to the other mechanics.’

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