THE MITCHINER MEMORIAL LECTURE THE DOCTOR'S DEBT TO THE SOLDIER*

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My first duty is to say how much I appreciate the honour of being asked to give this, the third Mitchiner Memorial Lecture. I had frequent contacts with Philip Mitchiner during the war both in England and later in the Middle East, but I suppose I got to know him best when, as a member of the same surgical travelling club, we visited surgical centres abroad. His candid comments of some of the surgery that we saw cannot be put on paper, and I always hoped some of them were not overheard by our hosts.

The reasons for an eponymous lecture are many; the person may have been the first to describe a disease or syndrome, or he may have invented an instrument, a splint, an operation, or even a piece of Gamgee tissue, but Mitchiner is remembered for something less tangible. He is remembered for the personal relationships which he made and which endured. If you liked Mitchiner you liked him always. If his name is attached to anything it is to "Mitchiner's Army". This is not to be confused with a larger unit of almost the same name—Kitchener's Army. Not being a Londoner I never had the privilege of serving in "Mitchiner's Army" but I do see here tonight people who were privates then who are now holding high rank—even a Lieutenant-General.

The Man

On meeting Mitchiner we were captivated by his face—his grey eyes, his wire spectacles, his clear cut features, and his look of austerity. His hair, "en brosse", never varied. On one occasion he had it cut that morning and the Director-General congratulated him on his recent "hair do". It is said that this all started in the Balkans where he had seen such large quantities of lice and other fauna, but we might think that he could have relaxed somewhat on getting back into what is looked on as the more sophisticated life of Harley Street. Although he had a somewhat Papal appearance his language would not always have been accepted in the Vatican. It was often basically suggestive of Chaucer and at times fundamental with a Rabelaisian ring about it. There was a magnetism about him and like a magnet he attracted or repelled. It has been said by someone that his rapier, usually a defensive weapon, seemed always unsheathed and ready for senior generals, consultant physicians, (field-m Marshals) or matrons, but never for subalterns, the house surgeon or the British soldier. He was a real iconoclast and hated insincerity, unfairness or oppression.

His uniform could be entirely functional when he wanted it to be, with an umbrella if this would help, but yet he could look impeccable in full dress with a well bemedalled chest, appearing equally comfortable on foot or on horseback. On one occasion he was reprimanded by a very senior officer for allowing his horse to be out of line on parade. His reply was that the general should speak to the horse and not to him—a remark which possibly could strain relations somewhat. His surgery was practical and lifesaving as indeed was his teachings. His book "The Science and Practice of Surgery" written in conjunction with Romanis, was often described as "A Book by Boys for the Boys".

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He had a deep love of children and it was always a sorrow to him that he had no family. His married life, as one would expect of a man whose guiding principle was loyalty, was indeed a happy one, but why he took eight years to propose to Margaret Philpott was hard to understand when he was able to make up his mind so quickly on other matters.

He filled every rank from Cadet in the O.T.C. to Major-General A.M.S. and at the time of his death in 1952 he was still adviser in certain military matters. The O.T.C. and R.A.M.C. were one life; his surgery, St. Thomas' and the Royal College of Surgeons were the other. It is given to few people to reach almost to the top both in the civil and military medical fields. We could say of him in Milton's words that he had that "complete and generous education which fits a man to perform justly, skilfully and generously all the offices both private and public of peace and war". Walter Landor (1775-1864) would have said of Mitchiner that he was a man "who had warmed both hands before the fire of life".

I suppose most people quickly looked from his face to his chest with its rows of medal ribbons. Some of these tell us a lot about the man himself. He had the Special Constabulary Long Service Medal which requires nine years continuous attendances with several hours per week—how few busy consulting surgeons could have given such demanding voluntary service? He had the Territorial Decoration for overseas service, a decoration for Territorial Officers which was discontinued in 1930. He had two other Territorial Decorations gained in two different reigns. Furthermore one ribbon could not have contained all the bars that he had won.

It is the Balkan medals which give us a picture of the other side of this man. In World War I he had been recognised by the Award of the Order of Saint Sava of Serbia and of the order of Saint Stanislaus of Russia with their bright ribbons and gay rosettes. The unimportant looking one without a rosette is very special indeed being the Gold Medal for devoted service in Serbia. In 1920-1921 when other people were hurrying home and trying to get established in a consulting practice we find that Mitchiner had returned to the Balkans to give further service. Serbia is now a part of Yugoslavia and the medal that he was then given is again The Order of Saint Sava but this time by Yugoslavia. This was for his post war service. He was nearly a national hero in Yugoslavia and it is not much wonder that we find some years later a Serbian peasant without a word of English appearing at his outpatients' department having thumbed his way across Europe. Such indeed was the personality and friendship of Philip Mitchiner for the underdog and it shows what faith and trust he was able to inspire in others.

His outstanding reputation in Serbia may have stood him in good stead when he applied for his staff appointment at St. Thomas' Hospital. He had met abroad Dudgeon, a senior member of the staff, who recognised his value and sponsored him strongly for the appointment. The Balkan Beam associated with the Thomas' splint may have been brought back by him but more likely by Max Page, another St. Thomas' man who was also in the Balkans in 1912.

I have called this paper "The Doctors' Debt to the Soldier" to show that every modern war has directly added something to the progress of medicine—either permanent or temporary.

The period from Waterloo to World War II was roughly 120 years and this easily falls into three periods of 40 years each. The total period covers the wars in which

Britain was directly involved such as the Crimea, the South African war, and World Wars I and II but it also covers two other wars, the Franco-Prussian and the Spanish Civil War in which, although Britain did not take a part, yet indirectly much useful knowledge was gained. Figure 1 shows the medical discoveries, their dates and their relationship to these various wars. In many cases a war was the practical field trial for a new invention.

Fig. 1. Medical discoveries, their dates and their relationship to the various wars.

The Crimea

The Crimea, which started in 1854, was the first major war since Waterloo some forty years before. The British Army was very much a Yeomanry Army—The Duke is said to have liked it that way rather than having too many professionals. By a happy coincidence ether had been introduced into Britain in 1846 by John Snow only to be replaced entirely one year later by chloroform at the suggestion of J. Y. Simpson. It is

interesting that the pendulum later swung back to ether and everyone would now agree that no more dangerous anaesthetic can be given to the shocked patient than chloroform. In most text books it is said that the American Civil War of 1861-1864 was the first major war in which anaesthesia was used. This is not so. The first real trial was in 1848, one year after it has been introduced, when it was used with such success in the serious riots in Paris. In the Crimea which was seven years after its discovery it was almost universally employed by the British and even more so by the French. Baudens in *Revue des Deux Mondes*, April 1857 claimed that they had used the drug 30,000 times without a single fatality. This the English were inclined to accept 'cum grano salis'.

The Crimea was indeed a war of muddle, misery and disaster. Dr. John Hall, the P.M.O. was slow to accept anaesthesia. Among other things he said "However barbarous it may appear the knife is a powerful stimulant and it is much better to hear a man bawl lustily than to see him sink silently into his grave". He was proved wrong before the war was over.

Since no antiseptics were available for the wounds the presence of maggots was frequently mentioned; we have all seen this even in modern times. This was first pointed out by Larrey but even in 1939 in an article in the *British Medical Journal* it is again mentioned in the casualties of the Spanish Civil War and the author suggests that further use could be made of these living scavengers. Bleeding was still a common practice although Louis twenty years before had proved it scientifically to be without a sound basis, and so we find that Lord Raglan sent to Smyrna for 12,000 leeches—all came up in tightly stoppered bottles and were naturally all dead.

It was very fortunate that plaster-of-Paris was available in the Crimea. It had been invented in 1852 by Anthonius Mahijsen, a Dutchman. I suppose he called it plaster-of-Paris because it was in Paris in 1765 that Lavoisier had shown that 95 per cent calcium sulphate with the right amount of water would crystallize and harden.

The new splint entirely replaced the former unsatisfactory bandage which had been stiffened with freshly made starch and further strengthened by cardboard. This idea had been suggested in 1840 by Seutin—a Belgian—but it naturally was impracticable as it took 24 hours to harden. Pirogoff made great use of plaster-of-Paris impregnating woollen socks with the paste. Nicolas Ivanovitch Pirogoff (1810-1881) was in charge of the Russian troops at Sebastopol where deaths were mostly due to erysipelas, pyaemia, gangrene and purulent oedema (gas gangrene). It was he who coined the expression "War is a traumatic epidemic". He is best known of course in this country for his partial foot amputation. Pirogoff was a much more able man than any we had to offer on the British side. This is not to decry the very fine work done, especially in Malta, the staging post for our returning casualties (Fig. 2).

I happened to be one of a party of surgeons visiting Russia in 1957. We left Britain where on all sides we were commemorating the centenary of the Crimea and giving great praise to Florence Nightingale for her forward surgery, and it was interesting to find in Russia that they were doing much the same giving great credit to Pirogoff and also great praise for the nurses who all had also served in the forward area.

One of the important results of the Crimea was the development of the first field dressing and a start was made for better transport for the wounded. Reputations were made for civil practice by men like Gamgee and Spencer Wells. The latter always stressed

<u>YEAR</u>	<u>MEDICAL DISCOVERY</u>	<u>BRITISH WAR</u>	<u>FOREIGN WAR</u>
1815		<u>WATERLOO (1815)</u>	
		↑ 40 YEARS ↓	
1846 1847 1852	Ether (John Snow) Chloroform (J. Y. Simpson) Plaster of Paris (Mahijson)	<u>CRIMEA (1854-56)</u>	Riots in Paris (1848)

Fig. 2. Medical discoveries during the forty year period from Waterloo to the Crimea.

how much help for his gynaecological practice he had got from war surgery. Spencer Wells and Gamgee were both attached to the Navy. Florence Nightingale gave nursing a status which it has never lost. It raised the profession into a new sphere far away from the Sairey Gamps. Although it may have given the profession as a whole a more scientific basis yet Florence herself to her dying day refused to accept that such things as bacteria could exist.

Joseph Lister did not go to the Crimea and was much criticised for it. He was at that time a Quaker. His surgical chief, Richard Jas. Mackenzie (1821-1857) went to the war but never came back. He died of asiatic cholera at Sebastopol. Had he returned it is doubtful if Lister would have ever got his staff appointment; Lister was the only one of the seven residents in his year in the infirmary who did not go to the war.

Following the Crimea little seemed to have been learned and anything of importance tended to be forgotten for it was another forty years before Britain was to fight another war and send a further expeditionary force overseas, and so it was fortunate that another war intervened, the Franco-Prussian War of 1870, not involving Britain, which acted as a refresher course and made our medical services at least be somewhat prepared for the South African War when it broke out in 1899.

The Franco-Prussian War

The Franco-Prussian war broke out in September 1870. Some 62 British surgeons and 18 nurses travelled to the continent ostensibly to give their services freely and impartially to either side. One of those to go was a surgeon from Belfast (William MacCormac) who impatient with his slow progress, decided to seek larger fields. He was sent out by the British National Aid Society—the forerunner of the British Red Cross Society. Neither the B.R.C.S. nor its parent body The International Red Cross Society were in existence as yet although the Red Cross as an emblem, as a flag or an armband, was in use. The Red Cross Flag had replaced the old black flag which on the Field of Battle at one time was the collecting point for the dead, dying or wounded. The history of the Red Cross, the outcome of the work of the young Swiss Banker Dunant, is known to all and in recognition the Red Cross flag was chosen as it presented in reverse the flag of his country.

MacCormac, an extrovert, a man of very striking and handsome appearance—(he was said to be the prototype used by Luke Fildes for the famous portrait next door

in the Tate Gallery of "The Doctor")—went out as second in command of a combined American-British Field Ambulance. His Commanding Officer was Marion Sims, better known in civil life as a gynaecologist, but from a war point of view he was a veteran of the American Civil War of some four years previously. It must be a relief for a gynaecologist to get a chance to do a bit of honest surgery occasionally. Spencer Wells in The Crimea it will be remembered did the same.

MacCormac reported in Paris to Nelaton so presumably we must assume he was attached basically to the French side, but in his writings we see that he made contact with the leading surgeons on both sides. He mentions Esmarch, Thiersch and Billroth. He describes graphically the sad story of going over the battlefield one day with Baron von Langenbeck—the Director of Surgery for the German Forces—looking for the latter's son among the casualties. They finally found the boy mortally wounded.

MacCormac came of a very distinguished, if eccentric, family and was fluent in many languages and a regular visitor to continental surgical centres before the war. He was 7 years younger than Lister with whom he had a close personal friendship and so he was anxious to try out Lister's methods on war casualties. He complained bitterly however that he had not been supplied with sufficient carbolic acid to carry out the treatment—instead the government was sending out bottles of Liebegs meat extract and other products of very doubtful value. The German medical services on the other hand were well organised and contained the cream of the surgical world at that time and they were all using Listerian methods, whilst the French were in MacCormac's words—"a disorganised rabble"—This was a sad contrast to the days of Napoleon's Larrey when French Military Surgery was the best in the world. We do know that Germany accepted Lister's ideas much earlier than many parts of Britain (Fig. 3).

YEAR	MEDICAL DISCOVERY	BRITISH WAR	FOREIGN WAR
		CRIMEA (1854-56)	
1867	Pasteur (Bacteria)	↑	1861-64 Am. Civil War
1868	Lister (Carbolic)		1870 Franco-Prussian War
		40 YEARS	1875 Turco-Serbian War
1878	Thomas Splint (Dormant till 1914)	↓	1876 Turco-Russian War
1885	B. Tetanus isolated (Nicolai)		
1890	A.T.S. (Behring)		
1895	Konrad Roentgen		
1898	R.A.M.C.		
1899	T.A.B. (Almroth Wright)	BOER WAR (1899-1902)	

Fig. 3. Medical discoveries during the forty year period from the Crimea to the Boer War.

On Marion Sims returning to America MacCormac took over the control of the unit. It is extraordinary how infectious a war can be. If a man goes to one he wants to go to another. This applied to Sims and to Philip Mitchiner and MacCormac, in fact in the case of the last mentioned he, as the recognised expert at that time in Military

surgery in Britain, was sent off to two further wars: in 1875 the Turco-Serbian War and in 1876 the Russian-Turkish War. Reporting on these in the journals he stressed that both sides now were universally using the carbolic acid treatment. He came back from the various wars much decorated by both sides, but financially in the 'Red'. As a result of the reputation he made at the Franco-Prussian war he was appointed to the staff of St. Thomas' Hospital rising, like Philip Mitchiner, to be senior surgeon. Before leaving him I should say that at the age of 65 he went off again as Chief Surgical Consultant Advisor to the British Army in South Africa. For this he was given a salary of £5,000. Much of my knowledge of this man comes from his unpublished diary.

A direct result of the Franco-Prussian war was that the British Army Medical Services were reorganised and the medical officers for the first time came under the medical department with the abolition of the Regimental System. The Ambulance System was reorganised, garrison hospitals and general hospitals were suggested for the first time. It is unnecessary to say that all these improvements came from Bismarck's well organised army. It is worth mentioning at this point that the Prussian army was for the most part vaccinated and there were only four hundred and eighty three cases of smallpox while among the French there were 4,178 cases with 2,000 deaths.

South African War

The South African war broke out in October 1899 and lasted for 2½ years. It was fortunate for all concerned that one year before (1898) unexpectedly at a Lord Mayor's dinner in London, at which the Presidents of both the Royal College of Surgeons and the Royal College of Physicians were present, Lord Lansdowne took the opportunity of announcing the formation of the new Royal Army Medical Corps. There had been difficulties and obstruction for a long time from other units of the Army and the final announcement came out of the blue. The President of the Royal College of Surgeons (Sir William MacCormac) with much previous knowledge of Military Surgery had been doing a lot of work behind the scenes as also had Florence Nightingale.

When the war finally broke out consultants were asked for from the three surgical colleges. Sir William Stokes went from Dublin, to die on active service, Chiene from Edinburgh, MacCormac, Makins, Treves and many others of the top surgeons from London. MacCormac went out as a super consultant. When he and Makins left London they were seen off by 300 St. Thomas's students at Waterloo Station where they caught the boat train for Southampton. Frederick Treves from the London Hospital and many nursing sisters followed out in still later batches.

The nursing sisters were criticised as their dress suggested that they were going out for a picnic in marked contrast to Miss Nightingale's ladies; in fact after the war Treves (then Sir Frederick) got into great trouble in London when at a public dinner he said that in South Africa they had had two main plagues—one was flies and the other women. He continued "the flies were easy to get rid of by either smoking or sprays and they did disappear at night". To show that history repeats itself the very same thing had been said by Marion Sims in respect of the ladies in the American Civil War.

In MacCormac's diary he described the awful roads where carrying of the wounded was the only possible method as the use of horse drawn ambulance was impossible. Hand carrying was often up to six miles and might be as much as twenty but there were

2,400 men enrolled for this purpose alone. There were few forward units—the casualties had to be taken to a base hospital or a rail head.

The surgical lessons from the South African war were disappointing but much was learned in the field of hygiene and sanitation—for example treatment and prevention of certain infective diseases; improved rations; water purification; sanitation; control of flies and insects. As a direct result of all this a valuable manual of sanitation was produced after the war. The Thomas' splint was not mentioned. Hodgen's was the popular splint as for long carries it gave both bone and soft tissue support. The Long Liston—a hangover from the Crimea—had not been completely discarded. Surgical sepsis was much less than in other wars partly owing to the type of bullet as well as the terrain over which the battle was fought. In one hospital a surgeon had 2,000 cases of gunshot wounds with primary healing in 80 per cent—a marked contrast to the shrapnel wounds of later wars. The 'wind of shot' which was first mentioned by Larrey is again described. We have changed that attractive name and call it by the uninteresting one of 'blast' today.

MacCormac in his diary was not afraid to criticise the generals. He thought nothing of Buller at Ladysmith and he felt Kitchener got too much credit for the Sudan when the praise should really have gone to Hunter. He never forgave Kitchener for his famous remark "you want pills; I want bullets; and bullets come first". However, he thought there was no one in the world to equal Lord Roberts and it must have been all the more tragic to him when he was called in to see young Roberts—the Field-Marshal's only son—dying of a penetrating gunshot wound through the pelvis. He left Treves to look after him for the three days before the boy finally died. Exteriorization of the bowel, such a success in the last war, had not been invented.

Dupuytren had suggested cutting the anal sphincter and others had enlarged the faecal fistula. Young Roberts who, like his father, won the Victoria Cross really threw his life away trying to save the guns at Colenso, an impossible task with the area completely controlled by enemy fire. Although little is mentioned of orthopaedic surgery in the South African war yet Geo. Makins became a pioneer in vascular work. It is interesting that this speciality preceded by fourteen years the pioneer work of Robert Jones on orthopaedics. It was Makins who said "one battle can offer more material, and that of a more varied nature, than many years of experimental surgery". Sir Clifford Allbutt meant the same when he said "how vital is the blood of young warriors in the rearing of good surgeons".

Resuscitation was given by infusion of saline into the rectum, into the axilla and even intravenously. They also gave the so called "nutrient enema which expected an unsuspecting rectum to deal with a most unattractive mixed grill of food stuffs—solid and liquid.

Without doubt the greatest outcome of the South African war was the discovery of inoculation against the typhoid group of diseases by a very famous R.A.M.C. professor. Almroth Wright was Professor of Pathology at Netley from 1892-1902. He left the army over a disagreement which was in keeping with a man of his temperament. He at once took up a similar post at St. Mary's Hospital. However, he was back in the army in France in 1914 dealing with wound infection this time. For his inoculation programme in 1900 he was not given full facilities for total vaccination against typhoid. Unfortunately he was only allowed to try it out on a sample group, and so in the South African war among those not innoculated there were 59,175 cases of typhoid with 5,337 deaths.

In the 1914-1918 war inoculation against the enteric fevers was obligatory and in 53 months of war when our numbers rose from 269,711 to 2,528,400 in 1918 the total admissions for typhoid and para typhoid were 6,907 and the deaths 250. Had Almroth Wright been allowed to do the same for all the troops in the South African war thousands of lives would have been saved. To the end of his life (he died at the age of 85) he was an ardent anti-feminist. He made it a rule always to address a mixed audience starting with "Gentlemen and Ladies". I must declare a slight personal interest in him. My father and he were in the same class at school together and remained friends throughout life.

As other wars had been the testing ground for new inventions so it is interesting to see that Konrad Roentgen (1845-1923), who had only produced his invention in 1895, was able under real bush conditions to have this functioning so soon in South Africa. Naturally the equipment was a piece of cumbersome machinery with coils and accumulators but with the coil giving a spark of 10-12 inches it was found one could get quite good results. Although difficult to transport it was easy to recharge the battery each night as electric light was almost universal, in all the small towns as well as in all the railway stations in the Cape.

After the South African war, as after every war, there was the usual criticism of medical services. MacCormac came back to face a barrage of letters in the Press. This rapidly died down thanks to the great support of Lord Roberts, Conan Doyle, Kipling and many others.

World Wars I and II

Most of us here who have served in one war not only have the personal knowledge of that war but in addition we were mostly taught by one of our chiefs who by word of mouth handed on the problems of the war before; in fact I am sure many people were subconsciously influenced by their teachers to join the R.A.M.C. or the T.A. and I suppose following Mitchiner's example we are now doing the same, perhaps also not intentionally. From a surgical point of view for this to take place there certainly must be an optimum period of time between the wars. This was not possible in the case of the Napoleonic-Crimean-South African wars where the interval between each was about forty years so that this relationship could not exist. A period of 14 years between the Boer War and the first World War not only allowed this arrangement to work well but it did, in addition, allow many men to serve in both wars. The interval between 1919 and 1939 of twenty years allowed the same thing to happen for many people as indeed it did for Philip Mitchiner. In this latter interval there was in addition another war which, although it did not directly involve Britain yet gave the army medical services valuable information. This was the Spanish Civil War. From this war we were fortunate to get certain emigrés—such as Trueta—as well as having some of our own more adventurous medical officers trained in an unusual military experience (Fig. 4).

The Spanish Civil War

It is sometimes forgotten that the Spanish Civil War ended just six months before World War II began—and the type of war seen in Spain—the civil bombardment—was somewhat similar to what did actually occur in Britain during what is often stupidly called the "phoney war" period. From this much useful information was obtained. The same type of "bricks and mortar" injuries were found. For such injuries plasma was

YEAR	MEDICAL DISCOVERY	BRITISH WAR	FOREIGN WAR
1901	Landsteiner (Blood groups) (1914-18 Experimental) (1939 Organized B.T.S.)	BOER WAR (1899-1902) ↑ 14 YEARS ↓ 1ST WORLD WAR (1914-18)	
1931	T. Toxoid (Ramon)	↑ 20 YEARS ↓ 2ND WORLD WAR (1939-45)	1936-39 Spanish Civil War Plasma Surgical Teams
1935	Sulphonamides (Domagk)		
1939	Blood Transfusion		
1940	E.M.S. Hospitals		
1943	Penicillin		
1943	D.D.T.		

Fig. 4. Medical discoveries during the forty years from the Boer War to the Second World War.

found to be a wonderful remedy to combat shock and injury since there had been little or no external blood loss and so based on these premises Whitby (Brigadier Sir Lionel Whitby) built up our own early Blood Transfusion Service. Plasma instead of blood of course had from the administrative point of view many advantages—preservation, storage, drying etc. Later in the war with much external blood loss, as in the desert fighting, plasma was found to be no longer sufficient. Several people here tonight, I am sure, were present in the desert when the “battle of plasma versus blood” was fought out between Lionel Whitby and Colonel Buttle. I remember Whitby telling me on one occasion that he had been able to grow the best roses in Bristol as they thrived on the red blood corpuscleless which he had to discard in the making of his plasma.

The Spanish Civil War started in July 1936 and ended in February 1939. It was fought between the Republican Army and General Franco's Forces. It was mainly a war of retreat from Madrid to Valencia ending with the prolonged siege of Barcelona. Surgery for the most part was based more on German than British methods as the Catalan School of Surgeons was very much under German influence. They were considerably influenced in the treatment of fractures by Böhler. The Thomas' splint, which had come into its own in the 1914-1918 war, was considered out of date and discarded in favour of the Braun-Böhler splint; although the former splint was occasionally used it was mainly for transport.

The Winnet Orr treatment of the compound fracture with bone and soft tissue damage was revived and used extensively. It saved manpower and with the wound undisturbed in its plaster cast it gave the “vis medicatrix naturae” a chance to exert itself in young healthy patients without the natural process being hindered by toxic antiseptics or constant re-infection. It is interesting that although this method has much to be said for it, it never made any impact in Britain and even when Winnet Orr himself was asked in 1930 to come and demonstrate his methods to Hey Groves, although his demonstration was most successful, still it was never accepted. Possibly it was a good war treatment but not suitable for peace time conditions.

Blast—that is surface blast—was investigated by the Spanish surgeons, which was of considerable help to us later both in the treatment of our own cases of surface blast

as well as our cases of under-water blast from depth charges, which was later so frequent among our naval casualties. For blood transfusion they used mostly stored blood obtained from universal donors. They stressed the difference between a civil and a war injury. In the civil wound the maximum damage is on the surface and the trauma decreases as we go to the depth of the wound. With a war wound the maximum damage is often at the bottom of the wound whilst the surface point of entry may appear unimportant. The treatment of a war wound is the greatest test of the ability of a surgeon. Any one can do a gastrectomy—the books tell you how to do it, but the war wound requires a great deal more—an understanding of the vitality of the tissues in the wound itself, of the patient's over-all vitality, of the vascular supply to the limb, of the presence of hidden pockets of haematomata, but most important of all the surgeon must have a full knowledge of what the evacuation of the patient entails, and of the care that he is likely to have in the various staging posts before he finally comes to rest. The treatment of the wound is only an incident—the major one I admit—in the whole sequence of events.

Great stress was put on the importance of soft tissue support. Possibly in the early stages we were too much impressed with bone fixation thinking that the Thomas' splint giving bone full extension and good alignment was all that was necessary. In the later stages in the desert we appreciated the value of the Tobruk splint which gave both bone and soft tissue support as well as did its counterpart, the thoraco-brachial splint for the upper limb. The Spaniards suggested that we should always consider the proportion of bone to muscle; if bone is in excess then osteomyelitis probably is the major problem, if muscle is in excess then the possibility of gas gangrene must be continually remembered. It is not as simple as all that but it is a useful reminder for the young surgeon.

It was fortunate as far as the Spanish war was concerned that Ramon at the Pasteur Institute had in 1931 produced his "vaccine" (which he called anatoxine) for *active* immunisation against tetanus to replace the old *passive* A.T.S. We, in Britain, renamed Ramon's "anatoxine" calling it for some unknown reason "tetanus toxoid". It was probably the greatest advance then made and the Spanish war was the first major operation to test its full value under war conditions.

With gas gangrene I feel no progress has been made. The treatment of gas gangrene is prevention, and after that super radical surgery. There is nothing between. There is no place for sera, for antibiotics, for deep X-ray treatment; once a tissue is dead the problem is irreversible. This may sound an admission of defeat. We have all saved many cases of gas gangrene fasciitis where the gas lies between the muscle layers but with infection involving the upper thigh muscles invading the anterior or posterior abdominal wall I still have to register my first success.

With the advent of antibiotics and antiseptics the reason for amputation has suddenly changed. At one time it was done for infection or to prevent infection. It was Dupuytren who said that "by avoiding amputation more lives were lost than limbs saved". Infection now is no longer a major problem and amputation should be reserved only for the limb made useless and totally devitalised by loss of its neurovascular supply. Larrey records 365 amputations in his series of 8,000 wounded. In the Spanish war there were 342 in 42,000 wounded. In addition we must realise that the traumatising potential of the modern missile had greatly increased.

Surgical mobile teams were a feature of the Spanish war. They were later perfected

by Major-General D. C. Monroe and proved to be a tremendous success in the later stages of the last war.

Although Winnet Orr's method of total occlusion (which was suggested to him when he saw in 1918 how well the American troops arrived back to the States after their long sea trip) was used, yet it was interesting to see that at the same time the extreme opposite method, using the technique of heliotherapy, where the wounds were left exposed to sun and daylight, was also employed in certain areas in Spain. This I suppose was the fore-runner of our present exposure method in the treatment of burns. It was indeed another example of the German influence. It is sad that, although the sulphonamides were used extensively in Barcelona, no scientific records have been preserved as all their notes were destroyed when the town capitulated and so we started the 1939-1945 war with no real knowledge of the value in warfare of this drug which Gerard Domagk had produced in 1935, just four years previously.

The 1914-1918 War

As a student and house surgeon to a returning consultant from the 1914-1918 war—Professor Andrew Fullerton—I had to carry out the techniques of that period. One of them was the tiresome and difficult treatment of Carrel Dakin in which small rubber tubes with minute perforations were inserted into all crevices of the wound and from an overhead bottle a continuous drip of “Eusol” kept the wound constantly irrigated. This fluid “Eusol” (Edinburgh University solution) was suggested in Edinburgh in 1915 by Lorrain Smith, Drennan, Rettie and Campbell. Dakin of Harvard at the same time was producing a similar hypochlorite solution and Alexis Carrel, working in a Field Ambulance in Compiègne, was organising the technique. It was short lived and is now only of historical interest. The fluid itself had no killing properties after one hour so the irrigation had to be continuous; the technical difficulties were insuperable and the value if any was due to the mechanical irrigation of the wound.

Blood transfusion (in retrospect) has been slow in being organised when we realise that the main hurdle was overcome in 1901 by Landsteiner. Even in the 1914-1918 war it was still experimental. Clotting was then the main technical problem. Kimpton and Brown in 1917 tried to get over this by their well waxed tube. Colonel Fullerton, working with Captain Bazett from Oxford, published in 1917 in the *Lancet* the Bazett-Fullerton tube for short direct transfusions from donor's artery to recipient's vein. In the same year the defibrinated method was suggested, an old method revived by Filatov where fibrin was removed by gently stirring the blood around a roughened glass rod until a spindle of yellow fibrin formed on the rod leaving the rest of the blood unable to clot. Although it was as early as 1914 that Hustin—a Belgian—suggested adding sodium citrate to the blood there were many further modifications made before it became the basis of the method in use today. In 1919-1920 blood transfusion was as formidable as the operation and often more time consuming. My duty was to rotate the flask gently to allow the fibrin to settle slowly and firmly on the glass rod.

My junior chief was an expert in the Thomas' splint and was writing his Mastership thesis on it. My part in the thesis was to carry large heavy crates, weighing $\frac{1}{2}$ cwt of glass X-ray plates mostly 15" by 12". These had come back from Wimereux, which was the Base Hospital for all cases of fractured femur. There was 95 per cent of the plates broken. We today forget what a boon the film, as compared to the glass plate, is in work of this

sort. In charge of the hospital was Colonel Maurice Sinclair, the expert in the Thomas' splint, who died only a short time ago. The Thomas' splint has had its ups and downs since H. O. Thomas suggested it in 1878 and in the preface of this book of that year he thanks young Robert Jones, his nephew, for reading the proofs. It was this same Robert Jones who in 1914 put this splint on the map. He got it adopted as an official piece of equipment for every civil ambulance and an accepted splint for the R.A.M.C. It is unnecessary to speak about it to this audience as everyone here has seen or taken part in the keen competition each year for the Cowell Cup.

Another of my chiefs trained in World War I was a great B.I.P.P. (Bismuth Iodoform Paraffin Paste) fan and before the abdomen was opened, as in the case of a perforated appendix, I had to smear the whole operation wound with B.I.P.P. It did certainly seem to prevent infection spreading between the muscle layers. Although trench fever from lice and trench foot from damp and puttees were a serious war problem yet they were soon forgotten as they did not persist over into civilian life. Trench fever was responsible for 200,000 casualties in the early part of the 1914-1918 war.

Gas gangrene was a much greater problem among the Allies in the 1914-1918 war than among the Germans as the latter still remembered the value of débridement. I am afraid that "Edward the Peacemaker" had lulled Britain into a sense of false security both from a military as well as a medical angle. As for tetanus passive immunisation with only anti-tetanic serum was all that was available. The serum gave only partial protection and so there were a great many deaths; inadequate surgery and the well tilled soil of Flanders helped to increase the problem.

Great faith was still placed in surface antiseptics. Synthetic dyes of many psychedelic colours were produced with claims that could not be substantiated. Many of the best surgeons soon rediscovered that soap was the best of them all.

Fortunately typhoid fever was no longer a problem thanks to Sir Almroth Wright and as for typhus, once the vector of the disease was discovered, the correct preventative treatment was not difficult to organise.

World War II. 1939-1945

The 1939-1945 war is too close for us in the context of my subject to appreciate its value. We are today living on the advances and benefits that have arisen from it. Neurosurgery, maxillo-facial surgery, orthopaedic surgery, in fact every branch of surgery with possible gynaecology least of all, benefited by this war. The problems are the same today although the operations may be carried out with more luxury in the ivory towers of the N.H.S. hospitals rather than in a desert tent or a bhasha in Burma.

A few things do stand out in one's mind. The first of these is naturally penicillin. In the first of the army trials of this drug, when Florey gave us the entire stock available at that time in Britain, I had the honour of playing a part. My small team of three was sent to North Africa firstly to deal with the latest casualties of the Eighth Army, now unfortunately rather chronic septic cases at the Base Hospitals, and secondly to prepare for the invasion of Europe with the First Army. We had only enough material for twenty patients by systemic injection but enough for about 200 or more casualties if the powder was used diluted with sulphonamide and used as a first dressing to the fresh wound. I resented the use of sulphonamide as the diluting agent as it seemed to me to complicate the true assessment of penicillin but it was pointed out that penicillin was so labile

and so dependent on the other agent having the correct pH that sulphonamide was the only available material. Our instructions were that it was not to be used in cases of bacterial endocarditis, certain chest conditions, osteomyelitis or venereal disease as all of these had already been the subjects of full clinical trials in Oxford. Our trials were to be essentially on war casualties. It was also laid down that it was not to be given to enemy wounded as it was in such short supply. I refused to accept this last order and insisted that I must be allowed to use my own judgement. I did not think that V.D. would raise any problem.

This is not the place to discuss the progress of this small unit which rapidly moved forward from base through L of C hospitals until finally the drug was applied almost at once after wounding. The further forward the better were the results. The reaction of the injection at first was much worse than the disease itself. The powder, dark brown in colour when diluted with water made a muddy solution like Colman's mustard. It was so impure that the injected area was tender, agonizingly painful, intensely swollen next day and the temperature higher than before the injection. This was somewhat alarming for 24 to 48 hours but the result after that was dramatic. It is sad that today the spectacular has gone out of cures with penicillin and the good result is an accepted fact. We had a very small quantity of a very pure penicillin. This had been "passaged" through a living patient and the patient's kidneys had acted as a biological filter. The overnight urine of these patients was collected by the then Mrs. Florey on her bicycle each day and brought in milk bottles to the laboratory. From each patient two thirds of the original penicillin could be recovered but half of this was lost in reprocessing so really it required the urine from three patients to produce enough for the treatment of one new patient. Some of these patients had been policemen in Oxford and the "policeman's penicillin" was very much sought after, as injection with it was virtually painless. Naturally the problem of impurity rapidly disappeared when further laboratory facilities were available. The progress of the drug since then is known to all. I heard a surgeon say the other day that his main duty in life now was to see that his patients did not get penicillin unless it was absolutely necessary. This is what has happened in twenty-five years to the greatest medical discovery of the last 200 years.

Another incident I would like to recall (I expect some here tonight were present on this occasion). We, the army consultants, were called into a D.G.'s conference with Sir Alexander Hood presiding. Having made sure that the door was locked and no unauthorised person present he proceeded to tell us that a new drug to be called by the figures 222 had come into the hands of the A.M.S. It had reached us secretly from Switzerland. He explained that this could solve one of our major problems in Burma. However, the formula must on no account get into the hands of the Japanese. It sounded very exciting and we knew nothing about it. Not many weeks later I was posted to India going out by Sunderland flying boat. I was intrigued to find that every alternate seat in the plane was occupied by a wooden keg marked 222. One could not help but say that this space-occupying parcel must be as valuable to the war effort as was each one of us. This of course was D.D.T. and the following figures speak for themselves (Fig. 5). Today, 26 years later we find that Canada and the United States of America have banned this drug; so have West Germany and France, yet in an editorial in the B.M.J. in October 1970 it is stated that "D.D.T. has saved ten million lives in Malaria eradication campaigns alone". The article goes on to say that although the more affluent countries may ban it on account of the destruction of wild life yet in the tropics it must continue to be

IN BURMAH HOSPITALS

	MEDICALLY SICK	PROPORTION OF TO	SURGICALLY WOUNDED
1943	130		1
		ARRIVAL OF D.D.T.	
1944	32		1
1945	9		1

Fig. 5. Comparison of the proportion of medically sick to surgically wounded before and after the arrival of D.D.T.

used. The only problem in these areas is the rapidly growing incidence of resistance among the insects and so we see that in 25 years, as with penicillin, a very similar problem of resistance has arisen.

In warfare in tropical countries the problem still lies in the battle between “the bullets” and “the bowels”. No matter how sophisticated our ballistic experts or our explosive scientists are yet we find that infection can always beat the trauma of the missile. Without sulfasuxidine in one battle the Australians were facing defeat, and it is said that sulfaguanidine allowed the British soldier to fire standing up while the Jap was still squatting.

An indirect result of the last war, which is at times forgotten, is that England for the first time in its long history had heavy casualties on its own soil and so to deal with this a new type of hospital had suddenly to appear. Until then in Britain we had had two types of hospital only—the voluntary and the municipal or poor-law hospitals. These were unable to cope with the extra load and so the E.M.S. hospitals suddenly took shape. They were meant to be temporary emergency hospitals but like many temporary things in life they became permanent in many places. Without the third group of hospitals and the additional beds Aneurin Bevan in May 1948 could never have been able to bring in, for better or worse, the National Health Service.

Conclusion

It has been said that “The Inspiration of a Nation is its Battles”. This was true when it was first said but unfortunately modern warfare is no longer a battle where gallantry has a place but is total destruction where all are in the front line.

It would be gratifying at this moment of time to be able to record a success story in the treatment of war wounds in which the “goody” beats the “baddy” and is able to cure the injuries of modern warfare. But we must realise that whilst the top scientists in medicine are giving us the tools to combat disease and injury yet at the same time we have the best brains in the country in another laboratory nearby daily devising some more lethal and destructive weapon, and so an escalating contest goes on without ceasing. The same thing is happening with road accidents where casualty departments no matter how well equipped cannot keep abreast of the speed of the modern motor and the thoughtlessness of the driver. I am afraid it is a losing battle.

The story I have tried to tell is an old one known to all, but as we all see things through different eyes we are inclined to highlight what interests us. I am sure I have left

much unstated and have perhaps ridden my own hobby horse and if so I wish to apologise. However, these lectures will go on for many years and each orator will have the privilege of dealing with his subject in his own way, looking either backwards or forwards. Philip Mitchiner with a foot in both camps and with the experience of two wars was able to link up civilian and military surgery and was able to show how dependant they are on each other—each has so much to give and so much to gain from the other.

My first slide showed Philip Mitchiner as a top ranking soldier.* I would like to finish with him at the zenith of his success, as Vice president of the Royal College of Surgeons of England. He was a doctor and a soldier, pre-eminent in both spheres.

Although I have called the paper “The Doctors’ debt to the Soldier” yet in Philip Mitchiner’s case we have seen the doctor and the soldier can be one.

*Editor’s Note. Due to shortage of space we are unable to include this portrait.

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