AMERICAN CIVILWAR ROUND TABLE OF AUSTRALIA
(NEW SOUTH WALES CHAPTER)

ENLIST NOW! …BUT DON'T GET SHOT OR SICK

MEDICAL SERVICES AT THE TIME OF AMERICA'S CIVIL WAR

OCTOBER 2003

This paper served as the basis for the presentation given by Dr Alan Winkworth to the New South Wales Chapter of the American Civil War Round Table of Australia at it regular meeting in October 2003.

Whilst the paper focuses on the medical services available to both sides of the conflict during the Civil War, it provides, also, a more general background to the state of medical science during the 19th Century. In doing so, the paper provides a basis for a better understanding and appreciation of the limitations to the medical services during the War that were the consequence of a deficient knowledge base of the time.

Those who were privileged to hear Alan Winkworth's presentation will appreciate that it was his medical background coupled with some very thorough and detailed research on his part that made the presentation something really special. His paper now provides members with a permanent record of this outstanding presentation and will serve as a most valuable resource and reference to anyone interested in the overall conduct of operations and the military and social outcomes of the Civil War.

This paper differs from others presented in that it is not in praise of the clever generals like Jackson or Grant or the incompetent ones characterised in song by the mythical Jubilation T Cornpone. Neither is it a description and analysis of any of the battles or campaigns of the War. It is about a great many people, some 600,000 of them, who did not come back from the War but died in hospitals, camps, on one of the many battlefields or on the march. This story is about death.

Death can come about in many ways. It may be instantaneous with a bullet through the heart or brain or it may be a lingering, long drawn out affair. It may be quiet or noisy, peaceful or accompanied by great pain.

Throughout the ages mankind has always spent more time and money trying to kill greater numbers of their enemies than trying to keep an even greater number of their own citizens alive and the 19th Century was certainly no exception to this.

It is important to note that of the estimated 620,000 men who died during the Civil War, twice as many died as a result of disease contracted in camps and hospitals as died in battle. This situation was exacerbated by a near complete lack of fitness or health screening at the time of recruitment. Statistics indicate that the Union lost 224,586 men from disease and 110,070 men in battle. The South's statistics were less precise that for the Union with an estimated 150,000 men dying from disease compared with 50,000 killed in battle. Presented in TABLE 1, below, is a breakdown of the numbers of Union troops dying from various diseases is presented:

TABLE 1: SELECTED SICKNESS AND MORTALITY STATISTICS FOR WHITE TROOPS IN THE UNION ARMY, 1861 - 1866[1] [2]

Number of Cases	Disease	Number of Deaths
75,368	Typhoid	27,050
2,501	Typhus	850
11,898	Continual fever	147
49,871	Typho-malarial fever	4,059
1,155,266	Acute diarrhoea	2,923
170,488	Chronic diarrhoea	27,558
233,812	Acute dysentery	4,084
25,670	Chronic dysentery	3,229
73,382	Syphilis	123
95,833	Gonorrhoea	6
30,714	Scurvy	383
3,744	Delirium tremens	450
2,410	Insanity	80
2,837	Paralysis	231

[1] Table C in *The Medical and Surgical History of the War of the Rebellion*, Vol 1. Part 1, pp 636 – 640.

[2] Just as the white troops and black troops were segregated in the Union Army, so too were the statistics of their illnesses.

These deaths were not due to lower standards of care in the medical services of the combatants but reflected the state of medicine in general in the 1860s. Army surgeons had the same knowledge and skills as their civilian counterparts. Indeed, the majority had been in civilian practice until hostilities broke out in 1861.

What was the State of Medical Knowledge at that Time?

There was no knowledge of bacteria as a cause for disease. Although Pasteur was working on his pioneering work in the 1850s, it was not until 1878 that he made his epochal statement and proof of bacteria being a cause of disease. During the Civil War disease was thought to be caused by "bad air" as a miasma. Indeed, *malaria* literally means bad air. There was no knowledge of deficiency states like scurvy. There were no antibiotics and there was no consensus of the best way to treat wounds. There were theories and practices in place then which seem ludicrous to us now just as, no doubt, many of our remedies at the beginning of the 21st Century will seem laughable to our descendants at the end of this century.

They did have anaesthetics: nitrous oxide or laughing gas, ether or sweet oil of vitriol and chloroform. It is worth noting that ether was discovered in 1540 and prior to 1840 was used as a medicine to help bring up phlegm. Chloroform was a relatively new having been discovered in 1831.

One of the early uses of anaesthetics was by the top English surgeon Robert Liston (1794 – 1847), who was described as "… a lion of a man with a sharp knife and a sharper temper". In 1846, he amputated a diseased thigh watched by a crowd of students, one of whom was Joseph Lister. At the end of the procedure Liston declared to his audience:

"This Yankee dodge, gentlemen, beats Mesmerism hollow"

The newspaper headlines of the day proclaimed: "Hail Happy Hour! We have conquered pain."

The greatest publicity and acceptance of anaesthetics occurred when Queen Victoria had chloroform for the birth of Prince Leopold in 1853. The sovereign noted in her journal "the effect was soothing, quieting and delightful beyond measure"

The Causes of Mortality

Diarrhoea and Dysentery:
The main condition causing death amongst the troops on both sides of the conflict was diarrhoea and dysentery. From Confederate records it is known that in the first two years of the War 848,555 cases of illness were reported and that 226,828 of these cases were due to diarrhoea and dysentery. There were a number of factors that caused this situation most of which related to ignorance of what we would call basic hygiene. These factors included:

- Poor or no latrine trenches;
- Poor siting of tents;
- Laziness or indifference of the common to use latrines; and
- Their predilection for defecating and urinating just outside their tents with the resulting fouling of their water supplies after rain.

Medical officers, both Federal and Confederate, have recorded that no matter what else their patients had, they had diarrhoea.

Some of the therapies used for treating these conditions make for hair-raising reading. One such treatment was the cauterising the lower rectum for a distance several inches from the anus. Calomel strychnine, opium and acetate of lead, also, were freely administered. A large number of indigenous astringents were popular – blackberry, chinquapin, dogwood, cranesbill, sweet gum, marsh rosemary, pomegranate, knot grass, black oak, equal parts of red pepper and crude resin.

Many of the cases of both diarrhoea and dysentery were the result of dietary deficiencies like scurvy (which is discussed in some detail in a latter part of the paper).

Measles:
Most parents in Australia, the most highly urbanised country of the planet with 85% of the population living on the coastal fringe, now regard measles as a nuisance rather than a deadly disease. It was a very different matter in the United States in the 1860s with its large susceptible population who had come predominately from small towns and villages. With several thousand recruits in training camps, the disease took a terrible toll – 76,318 cases reported in the Union Army with a death toll of 5,177. It was not just the deaths caused directly by the disease but consequent ophthalmic blindness, bronchitis, persistent discharge from the ear and deafness, dysentery, typhoid and pneumonia that added to the toll.

Malaria:
People knew that it was worse near swamps and water but did not connect the disease with the Anopheles mosquito. Mankind had to wait until August 1897 for the proof of this connection and we are still waiting over a hundred years later for a vaccine!

In 18 months from 1862 – 1863, 25,723 troops had 41,539 cases with 227 deaths. Malaria is a chronic recurring disease very effectively lowering the stamina and ability of troops to fight. It was still a problem in World War II and during the Vietnam conflict. Today, it still ranks near the number one global health problem.

Typhoid:
The Surgeon General of the Confederacy concluded that of the total deaths of 68,838 in 1862 – 63, typhoid was responsible for at least 25% of that total. With typhoid, patients may die of dehydration or a chemical imbalance resulting from the dehydration or die in great pain from peritonitis from perforated bowels.

Smallpox:
Smallpox had been the scourge of mankind throughout the ages. In 1796, Edward Jenner (1749–1823), an English country doctor from Gloucestershire, after many years of observation had confirmed the local belief that if a person had cowpox[3], they seemed to have immunity from smallpox. He vaccinated a boy with matter from a cowpox pustule and six weeks later infected the boy with matter from a smallpox pustule. The boy remained healthy!

Emperor Napoleon insisted that all his troops should be vaccinated so smallpox was never a problem in the Imperial Army. Vaccination was not widespread in America, however, and, as a consequence, smallpox epidemics were prevalent. There were, for example, epidemics in the Army of Northern Virginia in both the autumn of 1862 and the winter of 1863 – 1864 and, in one week in December 1862, the Smallpox Hospital in Richmond reported 250 admissions and 110 deaths.

Pneumonia:
In the 1860s there were no X-Ray facilities and many medicos did not believe that the stethoscope offered any advantage in diagnosis. In those days most cases of pneumonia was due to *Streptococcus pneumonia,* a disease mainly affecting young men. Those affected had a raging temperature culminating after four or five days with a "crisis". It was common for Pneumonia to affect physically

[3] Cowpox was a milder bovine form of the disease.

exhausted troops who were often malnourished as well, causing a much higher mortality rate than might otherwise be the case. The large Confederate Chimorazo Hospital in Richmond reported 1568 cases of pneumonia and pleurisy during the War of which more than one-third (583) were fatal. In the Union Army, about a quarter of the 77,000 or so cases reported resulted in death.

Scurvy:
Scurvy is discussed in some detail in this paper as it is considered that it has not been given the proper significance it warrants when discussing Civil War mortality rates, particularly in relation to the differential between black and white troops[4].

It is now known that scurvy is a *deficiency disease* that is a consequence of insufficient Vitamin C in the diet. In the 18th and 19th Centuries scurvy was believed to be associated with moist air and a blockage of normal perspiration. Scurvy was the scourge of sailors at sea but affected large numbers of personnel on both sides during the Civil War, both on land and on the seas.

In earlier times, Lord Anson of the Royal Navy made a circumnavigation of the globe in 1740 – 1744. Of the 1955 men who left the shores of England, 320 died from fevers and dysentery and 997 died from scurvy! Patients developed swollen bleeding and spongy gums, huge bruises, swollen joints, lassitude, heart failure and died. It was recognised that on any voyage of six weeks or more 30% of the crew would die from scurvy.

James Lind (1716 – 1791), a Scottish naval surgeon, had protested about the poor accommodation, rancid food and foul water that were characteristic of naval life in the 18th Century and in 1753 wrote his *Treatise on Scurvy.* In 1754, he conducted the first clinical trial aboard the *HMS Salisbury.* Twelve scurvy patients were chosen with two each given a daily dose of a quart of cider, oil of vitriol, vinegar, a mixture of garlic, radish, Peru balsam and myrrh and the final pair oranges and lemons. The pair given oranges and lemons were fit for duty in six days and put to nurse the others, all who remained sick.

Our Captain James Cook was a firm believer in citrus as a preventative of scurvy. In contradistinctive to Anson, Cook lost only one seaman in his crew to scurvy during his voyages of 1770-1. he had, also, a comprehensive managerial regime involving cleanliness, scrubbing, fumigation, whitewashing and discipline. The only time Cook resorted to the lash was when he detected a sailor spitting out the sauerkraut or lemon juice.

The effects of scurvy not only involved hospitalisation of those affected but it lowered their resistance to other infections and the patients' ability to successfully undergo subsequent surgery (an issue discussed in a later part of this paper).

Other Relevant Factors

Clothing and Footwear:
The availability of sufficient clothing and adequate footwear has been widely documented. This was more a problem for the Confederates than it was for the Federals. For example, in 1862 it was reported that Longstreet's Confederate I Corps had 6.446 barefoot troops.

[4] It is interesting to note that over the period of the War the Union Army reported around 47,000 cases of scurvy (30,714 white troops, 16,217 black troops) although the numbers of deaths from the disease were almost the same (383 and 388, respectively).

Food:
Frederick the Great stated:

"An army, like a serpent, moves on its belly"

This statement was quite true in Europe with larger populations and intensive agricultural practices. Armies in the Napoleonic era foraged on the march and there was sufficient quantity and variety to sustain an army passing through a region. With the exceptions of Sherman's march to the Sea through Georgia and then north through the Carolinas[5] and Grant's Vicksburg campaign in mid-1863, this practice did not apply during the Civil War.

The paucity of food that might be obtained through foraging meant that the armies had to arrange sufficient supplies to feed the troops both in camp and when on the move. This logistical support to both sides of the conflict was primitive and inevitably teething problems emerged. There were many complaints from troops of the lack of variety in their food and lack of quantity even extending to such basics as bread. A Matron at the Confederate Winder Hospital in Richmond related that patients were so tired of eating dried peas day after day that they revolted and threw them all over the floor and walls. Soon after this episode, some 200 of the patients, avid for bread, tore down the bakery. She defused the situation by reminding them of her many acts of kindness to them, among which had been her willingness to stew their rats when the cook refused to do so! In another case, one Confederate soldier was so moved on one occasion to interrupt the preacher at a church service, who was calling on the Almighty for more courage for the troops saying:

"Hold on Brother Jones, hold on! There's no sense in asking God
for more courage for us, He knows we've got plenty of that.
Ask Him for more grub. That's what we need most of all"

Hospitals:
The hospitals used during the Civil War varied considerably in size and were commonly erected before a battle at a chosen spot where the surgeons could deal with the expected flow of casualties. These hospitals comprised tents, normally 14' by 15' and 11feet high that were often joined together and could each accommodate 8 – 10 patients.

Some hospitals were very large indeed - the largest was Chimborazo in Richmond, Va. It opened in October 1861 and had a capacity for more than 8,000 patients. It was composed of five separate hospitals or divisions, each comprising thirty buildings or wards. Each building was a single storey structure 100 feet long and 30 feet wide with ventilation by doors and windows and could accommodate 40 to 60 patients. It had an elevated position with good drainage overlooking the James River. There were five soup houses, five ice houses, a Russian bathhouse, a bakery capable of turning out 10,000 loaves of bread a day and a brewery where they could brew 400 kegs of beer at a time. Chimborazo had its own farm with 200 cows and between 300 – 500 goats.

Winder Hospital, also in Richmond, covered 125 acres and could accommodate 5,000 patients. It had a 16 acre hospital garden for vegetables and was worked by convalescing patients.

By the end of the War, the Union had 204 hospitals with a total bed capacity of 136,894. Some hospitals were large homes, hotels and warehouses that had been requisitioned by the military authorities.

[5] In Sherman's march to the Sea in 1864 his army was spread out over a 60-70 mile front and were likened to a plague of locusts. Perhaps this is why residents of those States still do not regard Sherman with any great affection.

Patient Transport:
Historically, the wounded in battle had a very rough time of it. The injured soldier lay on the battlefield until the fighting was finished. If his side had won, he might then get some attention. If his side had lost, he generally lay there until he died or until he could crawl away somewhere and possibly get someone to care for him.

After some battles the wounded were simply left to their own devices. The most callous and deliberate example of this was after the Battle of Culloden in 1745. The English commander, the Duke of Cumberland, second son of George II, was determined that the Highlanders would never be a threat to the English throne again. He posted guards around the whole battlefield with orders to kill anyone trying to gain access to the ground to help the defeated Scots. He kept this up for five days by which time the wounded had all conveniently died.

Things improved during the Napoleonic era. France's Chief Surgeon, Dominique Jean Larrey, who was eventually made a baron, had accompanied Napoleon on his campaigns throughout Europe and, from experience, knew that if a soldier was removed from the battlefield as soon as he was wounded, he would more likely recover more quickly and return to active service much sooner. Larrey developed his *Ambulance volantes,* horse drawn light two wheeled carriages with stretchers that were well sprung. Wounded soldiers could be taken from the field during the battle back to the surgeons for treatment instead of lying on the ground and possibly bleeding to death before the battle ended. He believed in early amputation and stated that he performed more than 200 in the first 24 hours after the Battle of Barodino. One every seven minutes! We do not know, however, how many of these survived.

Patient transport during America's Civil War seems to have taken a step backwards. There were many reports of the wounded being jolted about in unsprung wagons on rough roads and of inconsiderate drivers of the trains jolting the carriages when starting up. It must have been a very painful time for them.

Removal of wounded personnel from the field of battle to a field hospital was largely undertaken by members of the *Infirmary Corps.* They went in pairs with a stretcher with haversacks of bandages, splints and dressings and carried their patients back to the surgeons. All this was done while the fighting continued and many were killed in the exercise of their duty. There was no Red Cross in those days[6].

When a patient was brought in to a field hospital, he might be left on a stretcher or taken off and laid on the ground. His injuries were then assessed by a surgeon to determine the urgency of his needs and whether surgery was needed. If the wound involved the chest or abdomen, surgery was not an option. The patient was given some morphine and moved to a quieter place so he could die in peace.

A Digression – the Minié Ball

As the War progressed, the older spherical musket ball was replaced as the ammunition used in the newer rifled muskets by the so-called Minié ball. Developed in 1849 by Captain Claude Etienne Minié of France, this cyclo-conoidal projectile with the concave base created havoc and was the one single factoring the increased morbidity and mortality on both sides of the conflict. It had a higher muzzle velocity that gave the rounds a much greater range[7] and, importantly, penetrated deeper than the older

[6] It was not until 1881 that Clara Barton helped organise the American Red Cross becoming its first president. During the War, she worked through the US Sanitary Commission providing some support to the Union's medical services where she was known as the "Angel of the Battlefield.

[7] Whilst the round musket ball had an effective range of 150 yards, the Minié ball was still devastating at 450 yards. Its greater muzzle velocity carried the round further and with greater accuracy.

spherical musket ball. When the musket ball hit bone, it would generally glance off unless the shot had been fired at close range. When the Minié ball hit bone, it would shatter the bone and frequently the round would act like pieces of shrapnel and tear and damage muscles, tendons, nerves and blood vessels.

If one person was to be singled out as being responsible for the horrific carnage of the Civil War, the prime candidate would have Captain Claude Etienne Minié!

Back to the Wounded Soldier…

Amputation and its Complications

The initial assessment by the surgeon of the wounded soldier addressed a number of questions, the answers to which determined the urgency and type of treatment:

Where had he been hit? – Upper or lower limb?
Was there an exit wound?
Was it much larger than the entry wound?
Was the bone or bones hit?
How much was the bleeding?

If the patient had an exit wound and it was not much larger than the entry wound, exploration of the wound was not as urgent as one where the bullet was still in the tissues. If the wound was such that the bone was shattered, there was only one course of action if the patient were to survive or to have any chance of doing so – amputation. Bitter experience had proven that if amputation was needed, it was best done straight away. The mortality rate for delayed amputation was almost 100%!

For the lower limb, amputation was done below the knee, above the knee, about mid-thigh level or at the thigh joint. For the upper limb, the preferred site was mid-humerus but in many cases the whole upper limb and shoulder blade had to be removed. There were generally two techniques for amputation. The quicker one embodied an incision around the circumference of the limb cutting through the muscle and ligating the major arteries, retracting the muscle, stripping back the periosteum (the covering over the bone) and then cutting through the bone. The sharp edges of bones were filed down with a raspatory or nibbled away with a rongeur. The skin was brought together like a purse string. A good cushion of tissue was needed over the bony end or the whole thing would have to be done again shortening the length of the bone by 3 – 5cm. A better method was to use a flap so there was no suture line which would be subject to pressure, particularly if it were the intention of fitting a prosthesis or artificial limb at a later date.

In carrying out an amputation someone was needed to administer the anaesthetic, usually chloroform which was quicker than ether and the patient could be taken to a deeper plane of anaesthesia than with ether. The surgeon required, also, an assistant to help retract the muscles. The operating table was usually a couple of planks resting on saw horses or barrels. There are vivid descriptions of the pile of amputated limbs near the surgical tent with desperate soldiers raking through the legs to find a better boot or boots than the searcher had.

When the operation was finished, the patient was encouraged to breathe deeply to flush away the anaesthetic. Occasionally, the patient would be unco-operative and when this occurred a certain remedy was to pour a little chloroform or ether on the patient's scrotum – with a guaranteed response! Not an experience that one would wish to experience twice!

It sometimes happened that due to the larger than expected number of casualties, the medicos ran short of anaesthetic. In such circumstances they used the old method of giving the patient a large slug of

whisky laced with laudanum, having several strong aides hold the patient down and give him something to bite onto. Hence, the origin of the expression “to bite the bullet”.

Where a wound needed exploring to remove a bullet or pieces thereof along with pieces of cloth, dirt or grass, there was a variety of probes available. Some were soft silver wire often topped with a ball of porcelain. The most effective probe, however, was the surgeon’s finger as it could differentiate between bone and lead much more easily.

When all the wounds had been bandaged, the patients were given opium or morphine for pain relief. This was often administered in a liquid to drink but patients frequently vomited up the mixture. Another technique was to rub morphine powder into the wound with a finger. The third method was to mix morphine powder with a few drops of water and inject it below the patient’s skin.[8] The surgeons then waited for the wound to become red and swollen and to exude purulent material. Infection was so likely that it was regarded as a natural part of the healing process and was given the name *Laudable pus.*

Gangrene

The occurrence of swelling and darkening of the wound was what everybody dreaded – Gangrene. Gangrene had a very high mortality rate and its appearance after surgery often meant that there would be many more cases as surgeons sometimes did not even wash their hands after finishing one case and before starting another. Gangrene is caused by the bacteria *Clostridium welschii.* Some surgeons advocated treatment by cutting out all the diseased tissue and cauterising the wound with nitric acid.

Secondary haemorrhage, which occurred about six to ten days after surgery, was another dreaded sequel. This was most commonly associated with scurvy.

Some Statistics

For those who think army surgeons were bloodthirsty individuals who like nothing more than hacking of limbs that didn’t need to be amputated, the statistics show otherwise. If a limb was not amputated in the first 24 hours but performed several days later, the resultant mortality rate soared. Eight of every ten wounded at the Battle of Shiloh died when they had delayed amputations. Union figures show mortality for primary amputation at 23% but if the surgery is delayed the mortality rate rises to 52%. A breakdown of the Union Army amputations totalling 29,990 cases is presented below as TABLE 2.

TABLE 2: BREAKDOWN OF AMPUTATIONS FOR THE UNION ARMY

	Cases	Deaths	% Fatalities
Fingers	7900	198	3
Forearm	1700	245	14
Upper Arm	6500	1273	24
Toes	1500	81	6
Lower Leg	5500	1700	38
Middle Thigh	6300	3411	54
Knee Joint	195	111	58
Hip Joint	66	55	88

As a footnote, in the Franco Prussian War in 1870 – 71, French Army Surgeons performed 13,000 amputations of which 10,000 died.

[8] This technique was known in that time as ‘endermic’.

Exposure
Invariably, armies in the field have had to contend not only with the elements but also the inability of the government to supply its soldiers with adequate and appropriate clothing and camp equipment. Diarrhoea, dysentery, continued fever, rheumatism, catarrh, bronchitis, pneumonia, frostbite are but some of the ailments attributed by surgeons and commanders to exposure. This was particularly noticeable during the limited winter campaigns. Eleven members of the Fourteenth Georgia and Third Arkansas Regiments froze to death while on guard duty near Hampshire Crossing in 1862. Some were sitting, others lying down but two were standing with loaded rifles in their frozen hands.

Bad weather and exposure can have a devastating effect on an army as Napoleon found out two centuries ago and as Hitler did last century. The weather in the United States was not as extreme as in northern Europe, but it certainly played its part in their Civil War. In this, the South was more affected than the North. The Confederacy always had a problem in maintaining equipment and clothing supplies to its troops and there are numerous reports of the effects of wind, rain and cold on the combatants:

> Brigadier General Pillow reported that prior to the surrender at Fort Donelson in February 1862, his men were in the trenches night and day for five days exposed to snow, sleet, mud, ice and water without shelter and adequate covering and without sleep.
>
> The defenders of Vicksburg were exposed to torrential rain for nearly five weeks in the latter stages of the siege.
>
> After Gettysburg, the Army of Northern Virginia was similarly exposed. They slept in the rain, got up in the rain, cooked and ate in the rain, marched and sometimes fought in the rain.

If a soldier is cold and hungry, his morale plummets and his capability as a fighting unit is severely compromised. Furthermore, as a result of bodily stress from cold and insufficient food, his resistance to disease is also lowered.

At the other extreme, there were reports of deaths from sunstroke in the Stonewall Brigade during the march from Orange Court House across the Rapidan River before the Battle of Cedar Mountain in 1862.

Finally…

There is no better way to conclude this paper than by quoting a Confederate soldier in a Union field hospital after Gettysburg:

> *"This is a horrid night, cold and wet and rainy. Groans and shrieks and maniacal ravings; bitter sobs and heavy sighs, piteous cries; horrid oaths, despair; the death rattle, darkness; death."*

Sources

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