

FAMOUS FIGURES

William Campbell Maclean, Professor of Military Medicine, Royal Victoria Hospital, Netley, 1861 - 1885

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Maclean (Figure 1) was born in Ayr in 1811. He went to Edinburgh Medical School, then at the height of its fame as the most important in the world. He passed out as a licentiate of the Royal College of Surgeons there in 1833 and graduated in medicine the next year. Having two brothers serving in the Bengal Army in India, he wanted to join the Army from a young age. His parents objected, as they did not think his health was strong enough to endure the Military life of India. Undeterred, William Maclean joined the Madras Army in 1838 and remained in India, a Medical Officer of the Indian Army, until 1850. He had a brief return home in 1855 until 1857 at the time of the Indian Mutiny. He told of having to leave all his children, except for the youngest boy, behind in Inverness in the care of an Aunt of his wife's and a governess.

'The parting was very bitter to us – it was, and is, the severest penalty of life in India, as thousands of parents know too well' (1).



Fig 1. William Campbell Maclean.

Maclean was a garrison surgeon at Vizagapatam when the Mutiny, with all its horrors, was at its height. He recalled :

'We never knew from hour to hour when native troops might break out into mutiny. We slept every night with our revolvers under our pillows, merely to sell our lives as dearly as we could.'

In 1860 the Secretary of State for War,

Sydney Herbert, knowing of William Maclean's ability, offered him the professorship of Military Medicine at the new Army Medical School. Because of the all too usual interference and jealousies of the home medical military and the War Office against an 'Indian Army Officer', the same happened ninety years later when the great Slim was offered the post of CIGS, but he had help from no less a person than Miss Nightingale herself and, in his memoirs he recalled that it was she who obtained the terms good enough for him to be appointed and to remain in England for the rest of his career.

At Netley a major problem was that of heart disease amongst Soldiers – the 'Soldier's heart'. Maclean took a new line on the problem from predecessors. In his lecture to Medical Officer trainees he began by remarking that of the men entered on the Military medical lists as valvular disease cases, the great majority had no signs of valvular disease. 'No murmurs', he told them – 'Why is this?' He then explained to them that the official nomenclature had no heading under which to include 'irritable heart' – the rapid and often tumultuous action so common in soldiers. Although the syndrome was well known, for administrative reasons it was classified under 'valvular disease'.

Then he did something novel – he showed his audience a soldier fully dressed, and in full marching order. The man was dressed in heavy regulation clothing and greatcoat, field kit - including canteen, 60 rounds of ammunition, 75 percussion caps, haversack, rifle and sling, bayonet and large pack – weighing in all 48 pounds. When rations for three days, blanket and water bottle were added the total weight he had to carry came to 60 pounds.

He also pointed out the way the weight was distributed and the aggravation effect of the restrictive nature of the clothing upon respiration and circulation.

'Look again at this man buttoned up to his throat (Figure 2), his neck enclosed in a stiff leather stock, notwithstanding all that has been said in condemnation of that most mischievous and cruel collar. Look how the man is overweighted, note again how the weights are disposed in direct opposition to every sound principle of mechanics. Let us suppose an army of a division, dressed and accoutered as this man – in strict obedience, be it observed, to the very

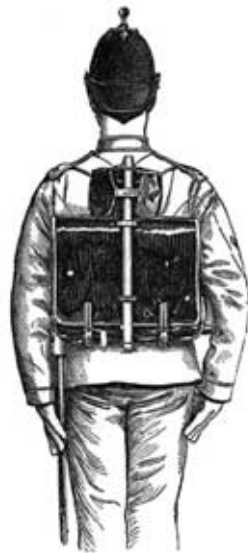
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letter of Regulations – was expected by the General in Command to make a rapid march over broken and difficult ground, and appear on the field at a critical moment. Could men hampered and overweight as this man accomplish their allotted part in such an

MEDICAL STAFF CORPS. MARCHING ORDER
(front view)



MEDICAL STAFF CORPS. MARCHING ORDER
(rear view)



operation? Without doubt, no'.

Fig 2. Medical Staff Corps. in Marching Order.

He reinforced his points by recounting his personal experiences 'as a mountaineer born and bred' and in India.

'I saw the 98th Regiment disembark for active service before the enemy, in almost every respect accoutered and weighed down like this man

before you. In a few hours fifteen or more were lying stiff and stark upon the hillside, struck down not by the enemy but by the sun and by the obstruction to free respiration and circulation'.

He compared this unit to another whose officers had sensibly allowed their soldiers to open their necks and carry a minimum of kit on their backs, and whose men did not suffer from the effects as the 98th had done.

Maclean had a younger colleague who, in fact, carried out research of the arguments he had so vividly shown at Netley to his class. He was Arthur Bowen Richard Meyers, a former student of Macleans. Meyers carried out an almost clinical trial of kit modification on cardiac irregularities amongst soldiers in India and the Sudan. In essence, his summary was that *'the young soldier's chest was fixed as in a vice'*. But the best record we appear to have of the problem, is a study by German Medical Officers, Braune and Fischer, who published their results in 1889 (2).

Braune and Fischer used their medical data to make modification of the equipment of the current German infantry soldier. They first studied cadavera with different loads and attitudes. Next they studied living soldiers in different military attitudes and with different loads of equipment. They showed how the soldier's centre of gravity was affected by these variations. They determined the effects of loading the soldier – how the weights of weapon and equipment acted on his centre of gravity, and showed how unfavourable position of equipment in the line of gravity put great demand upon muscle groups and led to needless fatigue (Figure 1). The quick thinking German staff at once developed methods of designing new equipment types and distributing the load for different postures and circumstances.

Of great interest is that a century later, Braune and Fischer's results were re-discovered. Their studies and their biomechanical data were used in 1985 as the basis for contemporary determinations of the static and dynamic forces on the hip and knee joints in standing and in walking. They were of use in developing prosthetic devices for hip and knee joint surgery.

References

1. Maclean W. Lecture on disease of the heart in the British Army; the cause and the remedy, *British Medical Journal* 1867; 1: 161-164.
2. Braune W, Fischer O. On the Centre of Gravity of the Human Body as related to the Equipment of the German Infantry 1889, translated by Maquet F, Furlong R. New York, Springer-Verlag 1985.