



Thomas Graham Balfour, pioneering medical statistician and stern disciplinarian

Art Cockerill¹ • Peter J Goble²

¹98 Maria's Quay, Cobourg, ON K9A 5R6, Canada

²Tentergate Avenue, Knaresborough, North Yorkshire HG5 9BQ, UK

Correspondence to: Art Cockerill. Email: achart@sympatico.ca; rma-rhms@gmx.com

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Peter Goble extracted data on admissions, misdemeanours, discharges and deaths at the Royal Military Asylum between 1 August 1827 and 20 August 1880 from the following documents held at the National Archives, Kew, London: W0143-18 RMA Chelsea Boys Admissions; W0143-24 RMA Chelsea Female

Thomas Graham Balfour (1813-1891) joined the Army Medical Department in 1836, becoming Assistant Surgeon to the 1st (Grenadier) Guards in 1840. He went on to become Surgeon-General of the British Army, and is chiefly remembered for his analyses of the military medical and veterinary (equine) statistics that had accrued since the Battle of Waterloo.¹⁻³ Major Alexander Tulloch, Balfour's superior officer in 1840, recognized Graham's talent in statistical analysis in a glowing letter to the Secretary at War.⁴ Seven years later, in 1847, Tulloch (by then Colonel Tulloch) wrote to the Minister at War seeking funds for Balfour to conduct a statistical analysis of incapacity and mortality among army pensioners.⁵ It is not known whether these funds were forthcoming.

From 1848 to 1858 Balfour served as Staff-Surgeon at the Royal Military Asylum at Chelsea. The Asylum was founded by royal warrant given at the Court of St James on 24 June 1801. As part of his reforms to modernize the army, the Duke of York, Commander-in-Chief of the Army and second son of George III, was principally responsible for founding the Royal Military Asylum for children (boys and girls) of soldiers killed or injured in the Great War with France (1793-1815). It was designed to accommodate 500 boys and 250 girls, but by 1814, it was home to 990 boys and 466 girls. In 1892, the Royal Military Asylum was renamed the Duke of York's Royal Military School, and relocated to new premises at Dover in 1908.⁶

It was while Balfour was at the Royal Military Asylum in the middle of the 19th century that he conducted a controlled trial to assess the effect of administering belladonna to prevent scarlet fever ('scarlatina'). Balfour's account of the trial was

recorded by Charles West, founder of the Great Ormond Street Hospital for Children, in a book about diseases of infancy and childhood.^{7,8} Balfour's account of his trial has been rated '...one of the most succinct and careful accounts of a clinical experiment ever written'.⁹ Balfour wrote:

There were 151 boys of whom I had tolerably satisfactory evidence that they had not had scarlatina; I divided them in two sections, taking them alternately from the list, to prevent the imputation of selection. To the first section (76) I gave belladonna; to the second (75) I gave none; the result was that two in each section were attacked by the disease. The numbers are too small to justify deductions as to the prophylactic power of belladonna, but the observation is good, because it shows how apt we are to be misled by imperfect observation. Had I given the remedy to all the boys, I should probably have attributed to it the cessation of the epidemic.

In the six years (1848 to 1853) before publication of Balfour's account, the population of the RMA had been fairly stable – at 346, 333, 329, 324, 334 and 341 boys, respectively. His selection of 151 boys for his controlled trial thus involved less than half the school population, implying that a substantial number had either already had scarlet fever or had other reasons for being ineligible for the study. It is not possible to comment further on the selection of 151 boys who did participate without access to the school medical records, which have not so far been found.

The registers of admissions to and discharges from the Asylum provide records of 24 deaths during Balfour's tenure. Between 1848 and 1858 annual numbers of deaths varied from none in 1852 and 1853 to seven in 1858. Causes are

Admissions; and
W0143-18 RMA
Chelsea Boys
Admissions.
Additional material
for this article is
available from the
James Lind Library
website (www.jameslindlibrary.org)
where it was first
published

mentioned for only two of the deaths ('gastric fever' in one death in 1854 and another in 1855), however, six of the seven deaths in 1858 appear to have occurred within a few days of each other, suggesting that a virulent, transmissible infection was probably the cause. There is no evidence of any such clustering of deaths in earlier years.

Although Surgeon Balfour is recognized today as an accomplished medical statistician who went on to be elected President of the Royal Statistical Society,¹⁰ he was also an exceptional disciplinarian at the Royal Military Asylum while he was staff-surgeon there. Taking into account both the number of boys in the institution and the period of tenure of previous Staff-Surgeons, Balfour disciplined boys four times more frequently than any other member of the Asylum's staff between 1803 and 1858, racking up a total of 248 charges during his 10-year tenure at the institution.

Balfour's charges are categorized under 'band', 'chapel', 'indiscipline', 'medical infractions', 'fife and drums', 'neglect', 'trespass', and 'lying'. Thus in the 'band' category, one boy was charged with 'not wiping his clarinet', others with 'unscrewing the handle of his trombone and loosening the screw', 'howling at band practice', 'putting a stick down the pipe of a bugle', 'talking at band practice', 'dropping his bugle at tattoo', and so on. Under the 'chapel' category, boys were charged with 'laughing and talking during divine service', 'improper conduct', 'marking his number in a prayer book'. Other violations included 'laughing during grace', 'making water in the bath', 'kicking a football in front of the Commandant's quarters', 'concealing part of his vegetables in a pan during dinner time', 'swinging on new curtain rods in the school room', being 'out of bounds', and 'telling a willful lie'.

Charges against boys were brought before the Commandant, and only he prescribed punishments. These were recorded, varied greatly, even

on separate instances of the same misdemeanor. Penalties for misbehavior were rarely cruel nor severe, often consisting of extra drill parades and duties, demotion, or having day passes withheld. However, they sometimes included between three and twelve strokes of a 60-inch cane on the buttocks, and the only really severe punishment – having to spend up to three days in the 'black hole', which was the name by which a military prison cell was known.

Thomas Graham Balfour made a lasting name for himself as an exceptional medical statistician; but a darker side of this pioneer of medical statistics emerges from evidence of his disciplinarianism while he was Staff-Surgeon at the Royal Military Asylum.

References

- 1 Balfour TG. Comparison of the sickness, mortality, and prevailing disease among seamen and soldiers, as shown by the Naval and Military Statistical Reports. *J R Stat Soc* 1845;8:77–85
- 2 Balfour TG. Comparative health of seamen and Soldiers, as shown by the Naval and Military Statistical Reports. *J R Stat Soc* 1872;35:1–24
- 3 Balfour TG. Vital statistics of cavalry horses. *J R Stat Soc* 1880;43:251–274
- 4 Tulloch A. Letter to War Office, 20 March 1840. Public Record Office W.O. 43/701, Folio 212. 1840
- 5 Tulloch A. Letter to War Office, 19 November 1847. Public Record Office W.O. 43/701, Folio 216. 1847
- 6 Cockerill AW. *The Charity of Mars*. Cobourg, Ontario, Canada: Black Cat Press. 2002
- 7 Balfour TG. Quoted in West C. *Lectures on the Diseases of Infancy and Childhood*, 3rd edition. London: Longman, Brown, Green and Longmans, 1854:pp 600
- 8 West C. *Lectures on the Diseases of Infancy and Childhood*, 3rd edition. London: Longman, Brown, Green and Longmans. 1854
- 9 Chalmers I, Toth B (2009). 19th century controlled trials to test whether belladonna prevents scarlet fever. *JLL Bulletin: Commentaries on the history of treatment evaluation* (www.jameslindlibrary.org)
- 10 Balfour TG. Presidential Address. *J R Stat Soc* 1889;52:517–537