

“SOLDIER’S HEART”: THE REDEFINITION OF HEART DISEASE AND SPECIALITY FORMATION IN EARLY TWENTIETH-CENTURY GREAT BRITAIN

by

JOEL D. HOWELL*

Studies of the social construction of diseases have clearly demonstrated how “non-medical” factors such as race, class, and gender are instrumental in their definition. However, less attention has been paid to how changing concepts of disease have interacted with political, military, and economic forces in the shaping of medical specialities. In this paper, I shall discuss how the disorder called “soldier’s heart” was redefined by British physicians during and shortly after World War I. Heart disease in soldiers was known by several names, including DaCosta’s syndrome (referring to a set of symptoms described during the American Civil War), irritable heart, and DAH (disordered action of the heart).¹ I will not attempt to answer definitively the question, “what was soldier’s heart?”² Indeed, I seriously doubt that the question even has an answer.³ Rather, I will use soldier’s heart as a window through which to examine changing disease definitions, the structure of medical research, and the development of specialized medical societies in the early twentieth century. I will argue that because heart disease in soldiers was the third leading cause of discharge from the British Army in the First World War, it became the focus of attention for military physicians in special hospitals set up to attempt to solve the problem.⁴ These physicians redefined the disease. The new disease, the effort syndrome, was more consistent both with acute wartime exigencies and with an

*Joel D. Howell, MD, MA, Department of Internal Medicine, University of Michigan Medical Center, Ann Arbor, Michigan, USA.

This research was supported in part by the Robert Wood Johnson Clinical Scholars Program.

¹ Or a variety of other names. I will attempt to use the names appropriate for each period being discussed, but do not mean to imply that one or the other is “correct”.

² For an interesting perspective, see Charles F. Wooley, ‘Where are the diseases of yesteryear? DaCosta’s syndrome, soldier’s heart, the effort syndrome, neurocirculatory asthenia and the mitral valve prolapse syndrome’, *Circulation*, 1976, **53**: 749-751; and ‘From irritable heart to mitral valve prolapse: the Osler connection’, *Amer. J. Cardiology*, 1984, **53**: 870-874. Thomas N. James links soldier’s heart and mitral valve prolapse through dysautonomia in ‘Sir Thomas Lewis redivivus: from pebbles in a quiet pond to autonomic storms’, *Br. Heart J.*, 1984, **52**: 1-23.

³ John Gabbay provides an excellent synopsis of the problems inherent in attacking such a problem in his ‘Asthma attacked? Tactics for the reconstruction of a disease concept’, in Peter Wright and Andrew Treacher (editors), *The problem of medical knowledge. Examining the social construction of medicine*, Edinburgh University Press, 1982, pp. 23-48.

⁴ Thomas Lewis, *The soldier’s heart and the effort syndrome*, London, Shaw, 1918, p. 1.

“Soldier’s heart”

ongoing transformation of the concept of heart disease from static and anatomical to dynamic and physiological. In the second part of this paper, I shall describe how the effort syndrome acted as a nidus for development of the Cardiac Club and the beginning of cardiology in Great Britain.

NINETEENTH-CENTURY IDEAS ABOUT HEART DISEASE IN SOLDIERS

Although the problem of heart disease among soldiers in the British Army was reformulated in the early twentieth century, the issue itself had been evaluated earlier within the anatomical, mechanical framework of nineteenth-century British medicine. Heart disease had first attracted official attention when soldiers from all parts of the world were brought to the Royal Victoria Hospital, Netley, which opened in 1863.⁵ In 1864, a government committee was appointed to study heart conditions in the army.⁶ It met yearly from 1864 to 1868, and concluded that the commonly used kit, which weighed, for heavy marching order, somewhat over sixty pounds, restricted the heart’s action and thus produced heart disease. Army Medical School professors agreed, issuing a report on the appropriate type of pack, stressing the necessity for avoiding “all impediments to the fullest expansion of the lungs, and to the action of the heart” (and noting the superiority of the Prussian pack).⁷ They held that unnecessary chest compression led to cardiac hypertrophy, with resulting dilatation and valvular derangement, and the eventual appearance of a characteristic “soldier’s spot” on the inevitable post-mortem examination.

In 1870, the issue of the cause of heart disease in soldiers remained important enough for the Alexander Memorial Fund to select for its first Prize Essay “the aetiology and prevalence of diseases of the heart among soldiers as compared with the civil populations of those countries in which they are called upon to serve, and the means of prevention or mitigation—due regard being had to the conditions in which the soldier is unavoidably placed”. The prize went to Assistant-Surgeon Arthur Myers, who recommended a simple remedy: allow the men to open their jackets. In his prize-winning essay, he admonished commanding officers for wanting their men to look “smart and set up” at the expense of their health.⁸

Two years later, Francis Moinet looked for a cause of cardiac disease other than the soldier’s clothing and gear. Reasoning from the mechanical relationships of the heart and aorta, Moinet argued that excessive rifle drills obstructed cardiac outflow. He pointed out that this argument explained the observed preponderance of aortic valve lesions in soldiers.⁹ Surgeon Arthur Davy agreed that obstruction was the primary cause of heart disease in soldiers, although he thought the obstruction was due to the “setting-up drill”, which produced a dilated chest and therefore abnormal

⁵ W.C. MacClean, ‘Diseases of the heart in the British army: the cause and the remedy’, *Br. med. J.*, 1867, i: 161-164.

⁶ R. MacN. Wilson, ‘The irritable heart of soldiers’, *ibid.*, 1916, i: 119-120.

⁷ MacClean, *op. cit.*, note 5 above.

⁸ Arthur B.R. Myers, *On the etiology and prevalence of diseases of the heart among soldiers*, London, Churchill, 1870.

⁹ Francis W. Moinet, *A treatise on the causes of heart disease with a chapter on the reason of its prevalence in the army*, Edinburgh, Bell & Bradfote, 1872, summarized in ‘A cause of heart disease in the army’, *Edinb. med. J.*, 1871, 17: 505-511.

action of the heart.¹⁰ The Irish Surgeon-Major, William Riordan, also rejected uniforms as the problem. However, he linked the hypertrophy of the soldier's heart with its displacement during position drills, labourers being more accustomed to a different way of standing.¹¹ For Riordan, the chief "affectation" was palpitation. Palpitation increased the power of the heart, and this in turn produced aneurism. He advised the army not only to change drill habits but also to pay more attention to personal comforts for the recruit in order to make him happier in his new, military surroundings.

These nineteenth-century studies of heart disease in British soldiers all shared a similar conception, that the problem was primarily hypertrophy, valvular lesions, and aortic dilatation—all mechanical lesions that admitted only a mechanical cause, usually some form of obstruction to the heart's outflow. The only question was the aetiology of that obstruction—either stylish uniforms, poorly designed drills, or compression of the thoracic cage by drill or altered work habits.

These formulations, based firmly on a mechanical understanding of the heart, shared two other implicit characteristics. First, they were of no value in identifying an affected individual so that he might be treated or cured. Hypertrophy, valvular disease, and aortic aneurism were permanent conditions. Once the diagnosis was made, there was little to be done for the individual soldier. The authors of these studies could only advise the army to alter its treatment of all soldiers in the hope that fewer men would become ill.

Although all of these experts considered the role of vices, primarily tobacco and spirits, as possible underlying causes, they concluded that the increased incidence of heart disease in soldiers required some other explanation. This led to the second assumption: that recruits were healthy, by-and-large, and that therefore the cause of disease lay somewhere in the army's treatment of these men. Early in the First World War, the idea that heart disease was due to a static mechanical defect caused by the army's training methods was to be severely questioned.

EARLY WAR WORK

In 1908, James Mackenzie, who would eventually play a pivotal role in developing ideas about soldier's heart, included the disease in the first edition of his *Diseases of the heart* in the section on "increased frequency of the heart's action".¹² The disease was found not only in soldiers, Mackenzie claimed, but also in "workpeople subject to severe muscular exertion", and was associated with free use of alcohol and a tendency to obesity. Sir Clifford Allbutt, the Regius Professor of Physic at Cambridge, also thought that "muscular exertion" was the determining cause of

¹⁰ F. Arthur Davy, 'A contribution to the etiology of heart disease', in *Army Medical Department report for the year 1876*, vol. 18, London, HMSO, 1877.

¹¹ William E. Riordan, *The causes of origin of heart disease and aneurism in the army*, Dublin, Fannin, 1878.

¹² Oxford, p. 126. For biographies of James Mackenzie, see R. MacNair Wilson, *The beloved physician*, New York, Macmillan, 1926; and Alex Mair, *Sir James Mackenzie, M.D. 1853-1925: general practitioner*, Edinburgh and London, Churchill Livingstone, 1973.

“Soldier’s heart”

soldier’s heart.¹³ Although he considered that exercise need not lead to cardiac disease, he warned the “overfed and self-indulgent person” against suddenly attempting vigorous physical activity. Allbutt saw the prognosis for soldiers as bad; most remained in hospital until invalidated out of the service.

By describing the disease in this fashion, both Allbutt and Mackenzie rejected nineteenth-century theories linking soldier’s heart with causative factors found exclusively within the army. Although their descriptions reflected a shift in attitudes about soldier’s heart, neither paid any special attention to the disease until the Great War. When German troops marched into Belgium in the summer of 1914, there was already a significant literature on diseases of the heart in soldiers. Not that this seemed a particularly urgent problem at first. “Home by Christmas” was the cry. But, as the war dragged on, devastating new entities like poison gas, machine guns, and barbed wire presented physicians with hitherto unknown medical concerns. Heart disease first attracted serious attention following the August 1914 retreat from Mons, which saw many soldiers sent back to England with chest pain, dyspnoea, palpitations on exertion, and tachycardia.¹⁴ It eventually became the third leading cause of discharge from the British Army during the war.¹⁵ (“Chest complaints” comprised the second most common cause for discharge, about the same order of magnitude as “heart disease”.) Although falling far below “wounds and injuries” in terms of absolute numbers, patients with heart disease seemed to constitute a group with which far more could be accomplished, both before and after enlistment.

Thus, the war acted to focus official attention on the problem of soldier’s heart. Eventually, that attention was to be directed to the soldier sent back from the front, but at first, the problem the army faced was that of assessing the physical condition of recruits. Nearly a million men signed up in the initial burst of patriotic fervour, and no serious attempt was made to assess their medical condition.¹⁶ Trauma was difficult to predict, but it became clear that the examining medical officer needed to evaluate carefully the cardiac status of any potential soldier. In so doing, he faced a serious practical problem. He could not admit someone with a manifestly damaged heart that was bound to fail, but did murmurs and irregularity always indicate severe damage? This problem, the “superstition that a heart to be normal must be free from murmurs and irregularity”, as Mackenzie put it, prompted the first organized medical attention to heart disease in the army.¹⁷

The autumn of 1915 saw James Mackenzie’s first memorandum on soldier’s heart, a brief guide both distributed by the War Office and published by the *British Medical Journal*.¹⁸ Mackenzie saw as the primary issue the *functional efficiency* of the heart

¹³ T. Clifford Allbutt, ‘Soldier’s heart’, in Thomas Clifford Allbutt (editor), *A system of medicine by many writers*, London, Macmillan, 1905, vol. 5, pp. 851-855.

¹⁴ John Hay, ‘Cardio-vascular disorders’, in W.G. MacPherson, W.P. Herringham, T.R. Elliot, and A. Balfour (editors), *History of the Great War, Vol 1: Medical services. Diseases of the war*, London, HMSO, 1923.

¹⁵ Lewis, op. cit., note 4 above.

¹⁶ Anthony Babington, *For the sake of example, capital courts-material 1914-1920*, New York, St Martin’s Press, 1983, p. 8 and p. 204; A.J.P. Taylor, *English history 1914-1945*, New York, Oxford University Press, 1965, p. 20.

¹⁷ James Mackenzie, ‘The recruit’s heart’, *Br. med. J.*, 1915, ii: 807-808.

¹⁸ James Mackenzie, ‘The recruit’s heart. A memorandum for medical examiners’, *ibid.*, pp. 563-564, also distributed as a separate sheet, 1693 (A.M.D.2).

(italics in original). Murmurs and irregularities were important only if they diminished the functional efficiency. If they did not, and this was to be ascertained either by asking the candidate how much exertion he was accustomed to or by observing him undergoing exertion without distress, then the candidate's heart was sound and he was fit for duty. Nowhere in this memorandum did Mackenzie use the term "valvular lesions".

This shift of focus from precise, anatomical lesions of the heart to general assessment of its global function was quite consistent with the "new cardiology" of the early twentieth century. As would be expected, those who objected to Mackenzie's approach based their arguments on the importance of murmurs as indicators of valvular lesions. They quite clearly saw the primary cause for rejection as the mechanical defect, the abnormal valve, rather than the "functional efficiency" of the "new cardiology". In opposing the "new teachings of the past twenty-five years", some chose merely to republish their earlier, 1890 teachings.¹⁹ However, Mackenzie and other proponents of the "new cardiology" both defined the increasingly accepted intellectual approach and, perhaps most important, quickly came to control the organized, governmental approach to the problem of soldier's heart.

The autumn of 1915 also brought a worsening military situation. The failure at Gallipoli was well under way, and in September, the disastrous attack at Loos resulted in an additional 50,000 casualties with very little gained. It was becoming obvious that the front would probably remain static throughout the winter and that the war could be a long one. In November, casualties sent back to University College Hospital, London, complaining of chest pain, breathlessness, palpitations, exhaustion, and giddiness prompted Thomas Lewis and his colleagues to write an "urgent" letter to the *British Medical Journal*.²⁰ This letter raised a different problem from that mentioned in Mackenzie's memorandum on the evaluation of recruits. Lewis had studied a group of soldiers sent from the front with "cardiac strain" or disordered heart action. These men complained of chest pain, breathlessness, palpitation, and fatigue. On examination, there was usually evidence of vasomotor instability. After excluding those who seemed likely to have structural heart damage by virtue of a past history of rheumatic fever, chorea, or syphilis, Lewis and his colleagues identified a group in which the symptoms appeared to be caused by toxins produced by staphylococcal or streptococcal infections. There was not to be the first wartime speculation on the cause of such symptoms in soldiers.

The *British Medical Journal* published several letters on the topic over the next few months. Most observers agreed that few soldiers did have clear-cut valvular disease seriously impairing the heart's action, and for the others the primary cause of cardiac symptoms and signs did not lie in the heart itself. Early ideas about the aetiology of "irritable heart" reflected the most exciting developments in clinical medicine over

¹⁹ James Kingston Fowler, 'Auscultation of the heart of the recruit', *ibid.*, 1915, ii: 744-745. For the debate over murmurs, the new cardiology, and the recruit's heart, see also Alexander Morison, 'The recruit's heart', *ibid.*, 1915, ii: 636-637; W. Gordon, 'Murmurs in the recruit's heart', *ibid.*, 1916, i: 433-434; and Mackenzie, *op. cit.*, note 17 above.

²⁰ Thomas Lewis, Thomas Cotton, and F.H. Thiele, 'A note on the "irritable heart" of soldiers', *ibid.*, 1915, ii: 722.



The figure shows a 28-year-old patient with a face typical of "DAH" (disordered action of the heart), one of the many terms used to describe soldier's heart. The picture was taken after fifteen minutes of easy exercise, and shows dilated nostrils, furrowed forehead, slightly opened mouth, and the general expression of fatigue and anxiety. These features were common to the description of both DAH and soldier's heart, and were given special attention as useful diagnostic features. From Thomas Lewis, 'The tolerance of physical exertion as shown by soldiers suffering from so-called "irritable heart"', *Br. med. J.*, 1918, i: 364.

“Soldier’s heart”

the past decade or so: the discovery of circulating hormones and establishment of the new field of endocrinology, and the rapid progress of microbiology in identifying bacteria and associating them with specific human diseases. Some suggested that hyperthyroidism was the cause of the disease. Infections were sought in several locations and were postulated as the cause through a variety of mechanisms. The infection did not need to be coincident with onset of symptoms. It could precede them by months or years, or it could be a smouldering invasion by micro-organisms, such as tuberculosis bacilli, that had yet to become apparent.

However modern new ideas like excessive glandular secretions or infectious toxins may have seemed, they were of little help in dealing with the acute problem posed by the war and soldier’s heart. The older theories, revolving around improper drill and poorly designed uniforms, at least held out easy, obvious approaches to prevention and treatment. Remove the inciting cause; change the constricting uniform; stop the offending drill. The newer theories were more consistent with changes in medical thinking, such as the “new cardiology”, but they made both prevention and treatment seem more difficult. It was not so easy to cure infections or hyperthyroidism. X-rays were a possible treatment for the latter, but few actually thought that more than a very small percentage of the soldiers being returned were suffering from hyperthyroidism.²¹ Treatment for infections was limited to “increasing the general health of the body in such a way as to increase the natural resistance to infection”.²² This was fairly non-specific therapy, and unlikely rapidly to replenish casualties from the front.

Early in 1916, Sir James Mackenzie opened a session of the Section of Therapeutics of the Royal Society of Medicine with a paper on ‘The soldier’s heart’.²³ In it, he discussed the examination of some 400 soldiers invalided with heart disease. Mackenzie thought that the cases were overwhelmingly non-cardiac, the most likely aetiology being the strain and exhaustion of life in the trenches superimposed on some “toxic influence” caused by infection. He declined to speculate on treatment of the bacterial invasion (other than to suggest the possibility of vaccine therapy), but focused on uplifting the soldier’s generally depressed mental and physical state through exercise. For officers in his private practice, Mackenzie advised “fishing, riding, shooting, golf” (the last a particular personal favourite of Mackenzie’s), and he urged the same kind of “congenial exercise” for lower ranks. Lest his motives be misunderstood, he emphasized the need for “not only . . . the pleasure of the sideman, but so that the soldier may speedily regain his health and return the sooner to his duties”.

RESEARCH AT HAMPSTEAD AND COLCHESTER

Swift return to duties was the goal for most wartime agencies involved with invalided soldiers. With this priority, it is hardly surprising that the structure necessary to implement Mackenzie’s suggestions was not long in coming. Once

²¹ There was notable absence of support for James Barr’s vitriolic writing on hyperthyroidism as the obvious cause for soldier’s heart.

²² ‘The soldier’s heart’, *ibid.*, 1916, i: 137.

²³ Sir James Mackenzie, ‘The soldier’s heart’, *ibid.*, 1917, i: 117-19.

established, the wards, hospitals, and groups started for one specific purpose developed a momentum and motivation of their own. Shortly after the onset of World War I the War Office had set aside a few beds in the military wards at University College Hospital for research on soldier's heart.²⁴ In the winter of 1914–15, the energetic young London physician, Captain Thomas Lewis, took charge of these beds. Lewis's appointment probably was in large part due to the efforts of Mackenzie, a close friend and professional colleague of Lewis. Mackenzie's earlier work with the polygraph had done more than make him a prominent figure in British medicine, one who could influence the War Department to establish a new hospital as well as to help run it. He had also helped to popularize the use of graphic records, such as the polygraph and the electrocardiogram (ECG), in the study of heart diseases. By so doing, he enabled Thomas Lewis, whose credentials lay primarily in the mastery of these instrumental methods, to be placed in charge of soldier's heart research. Lewis was eventually, in February 1916, appointed to the permanent scientific staff of the Medical Research Committee (MRC) to pursue clinical research.²⁵

Although Lewis had been studying the heart since around 1906, lack of financial support for research obliged him to continue to see private patients. He received the first Beit Memorial Fellowship for Medical Research in 1910, and in 1911 was named "Honorary Officer in Charge of the Cardiographic Department" at University College Hospital.²⁶ The honour of the title should not obscure the fact that Lewis still needed personal funds to purchase instruments, which he used in a basement broom-closet. While Mackenzie had a reputation as a master clinician, Lewis owed what medical standing he could claim to his work with the ECG. The ECG at first appeared to be a promising tool, and the MRC, which supported Lewis's work on soldier's heart from the beginning of the war, noted in its first annual report that cardiographic apparatus would be made available for the study of soldier's heart. But despite its early appeal, the ECG was to play no significant role in research on or treatment of heart disease in soldiers.

In 1915, Mackenzie had suggested to the War Office that a special hospital be established for treatment of patients with soldier's heart.²⁷ Near the end of that year, the War Office implemented this idea and transferred Lewis's work on soldier's heart from University College Hospital to the Mount Vernon Hospital in Hampstead. The Hampstead hospital was directed by a distinguished advisory committee consisting of Sir Clifford Allbutt, Sir William Osler, and Sir James Mackenzie. In September 1916, the War Office decided to have heart cases sent directly to Hampstead from France, not indirectly through other hospitals in Great Britain. By 1917, the increase in cases forced a move to larger facilities at Colchester.

²⁴ *Medical Research Committee Annual Report* (hereinafter *MRCAR*), 1914-15, 1: 44. There is no full-scale biography of Thomas Lewis. The most complete obituary is A.N. Drury and R.T. Grant, 'Thomas Lewis', *Obituary Notices of the Fellows of the Royal Society*, 1945-8, 5: 179-202. See also, Arthur Hollman, 'Thomas Lewis—the early years', *Br. Heart J.*, 1981, 46: 233-244.

²⁵ *MRCAR*, 1915-16, 2: 17.

²⁶ Drury and Grant, op. cit., note 24 above, p. 182; W.R. Merrington, *University College Hospital and its Medical School: a history*, London, Heinemann, 1976, p. 193.

²⁷ Sir James Mackenzie to John Parkinson, 3 December 1915, in Mair, op. cit., note 12 above, p. 63.

“Soldier’s heart”

Although one goal of the War Office was the rapid diagnosis and discharge of soldiers with serious heart disease, Mackenzie’s work made them hope that this group of soldiers would constitute a relatively small proportion of those sent to the hospital. The hospital was intended instead for the larger group, those with “true irritable heart”. The MRC and the War Office hoped that by bringing together a large number of these cases “many [more] might be returned to duty more rapidly by treatment with suitable and graduated exercises, than when remaining as independent cases scattered through military and convalescent hospitals; and it was expected at the same time that the cases found not amenable to treatment should, without prolonged delay, either be sent to appropriate light duty or be permanently invalidated”.²⁸

By 1916, it was clear to the British government that the war was going to last a good deal longer than the few months anticipated at its onset. The increasing need for manpower led to conscription, an unprecedented and unpopular decision in a country which had previously seen little governmental influence on daily life.²⁹ Such a drastic move made the need for accurate medical evaluation of soldiers seem all the more important. The diagnosis and treatment of soldiers with cardiac complaints was still in turmoil, and many military physicians had little patience with soldiers suffering from poorly defined complaints of any type.³⁰

The goal of the staff at Hampstead was the swift differentiation of those soldiers who could be sent back to the front from those who should be quickly discharged. In pursuit of this aim, the hospital received not only an ample supply of soldiers with suspected heart disease but also generous resources and whatever technical and professional personnel were required. Establishment of this hospital also played a key role in furthering the career of Thomas Lewis, who, in turn, was to be a premier figure in the maturation of the post-war Medical Research Committee (called the Medical Research Council after 1920).

In February 1917, the MRC published an early summary by Lewis of its research findings.³¹ This report was based on study of about 1,000 soldiers diagnosed as having soldier’s heart. The crucial feature of this report is that the symptoms and signs that might once have been interpreted as pointing to structural change and *ipso facto* have been sufficient reason for an invalidity ticket, were now assessed in terms of the heart’s total functional capacity. Primary symptoms of this disorder included breathlessness, pain, exhaustion, giddiness, and fainting—a constellation of symptoms that were merely “exaggerated manifestations of healthy responses to effort”.³² The MRC report therefore advocated the diagnostic term “effort syndrome” for most of these cases. The report described evaluation by graded exercises, with the emphasis placed on establishing prognosis, not diagnosis, and one

²⁸ MRCAR, 1915-16, 2: 58.

²⁹ Although of tremendous symbolic importance, the draft actually failed to provide more men for the army. Taylor, *op. cit.*, note 16 above, p. 55.

³⁰ Babington, *op. cit.*, note 16 above, esp. p. 60.

³¹ ‘Report upon soldiers returned as cases of “disordered action of the heart” (D.A.H.) or “valvular diseases of the heart” (V.D.H.)’, *MRC Special Report Series*, no. 8, 1917. No author listed, but Thomas Lewis cited as author in MRCAR, 1916-17, 3: 77.

³² MRC Special Report 8, *op. cit.*, note 31 above, p. 7.

simple objective: rapid return to duty when possible, rapid discharge when the disease was too severe. The financial importance of the latter is obvious when one considers that soldiers invalided with heart disease spent an “*average period of nearly five and half months in hospitals*”.³³ Graded exercises did more than merely serve a diagnostic function, they were therapeutic as well. By gradually increasing the intensity of the effort, and by rewarding a soldier’s successful performance at each increment of exertion, fifty per cent of soldiers with effort syndrome could be returned to duty after an average stay of only 1.5 months in the Hampstead hospital.³⁴

Four observations can be made about this research on soldier’s heart. First, as intimated above, the economic implications of reclassification were never far from the top on a list of justifications for such research. The dramatic reduction in hospital stay, from an average of 5.5 months to an average of 1.5 months, saved approximately £50,000 a year, almost as much as the entire MRC budget.³⁵ Moreover, as will be discussed in greater detail below, the government anticipated early in the war the profound impact any method for establishing the level of disability would have on pensions assessment, and studies of soldier’s heart explicitly reflected this need.³⁶

Second, despite the early appeal of graphic methods to many who worked at the military hospitals, neither the polygraph nor the ECG was found to be valuable in sorting out soldiers with possible heart disease. Lewis thought his own ECG was of “little or no value”.³⁷ This conclusion came despite the close connexion many of those involved had enjoyed with medical instruments: Allbutt had introduced routine use of the thermometer and the ophthalmoscope; Mackenzie had reached prominence in large part through his work with the polygraph; similarly Thomas Lewis and the ECG. For Lewis, the message was particularly clear. By 1914, he had attracted slight attention and very little financial support for ECG research; by the end of the war he was credited with saving vast sums of money and, perhaps more important, he was in the full-time employ of the MRC to pursue his research. Thomas Lewis was knighted in 1921, not for his basic research on the ECG, but for his work during the war on the effort syndrome. If the clinical approach to breathless soldiers was to be easily incorporated into the contemporary medical system, it needed an easily appreciable, non-instrumental basis.

The third generalization about the entity, effort syndrome, is that such a concept should fit easily into the “new cardiology” of the day. Physicians at Hampstead and Colchester directed attention away from local, particular valvular defects, de-emphasized the importance of murmurs and the stethoscope, and emphasized the global working ability of the heart. Whatever the cause (and infection of one sort or another was the most common proposed aetiology), the important final common pathway was failure of cardiac reserve.³⁸ While anatomical lesions could contribute

³³ *Ibid.*, p. 14, italics in original.

³⁴ *Ibid.*, p. 13.

³⁵ *MRCAR*, 1917-18, 4: 53.

³⁶ *MRCAR*, 1916-17, 3: 75.

³⁷ *Ibid.*, p. 38.

“Soldier’s heart”

to weakening of the heart, the actual state of the cardiac muscle could be ascertained only by observing the response to effort. The effort syndrome therefore accurately reflected the physiological emphasis on cardiac function.

Finally, the research carried on at Hampstead and reported by the MRC falls naturally into two general categories. First, there were empirical, clinical observations. These included studies on the response to carefully defined exercises, recommendations on the proper terminology (emphasizing the value of *not* using terms referring to heart disease), and speculating on the presence of malingerers, the effects of differences in class and occupation, and other practical points directly related to the wartime need to get soldiers either back to the front or out of the service. However, the hospital was to do far more than its supporters originally intended. It was to use the soldier’s heart as a setting in which to apply all manner of physiological testing, and to serve as a first step in organized, centralized governmental support of medical research. Intermingled with practical observations was a second, more physiological group of studies. These used patients with soldier’s heart to study such topics as buffer salts and their relationship to breathlessness, the effects of pilocarpine on sweating, the effects of atropine, adrenalin and apocodeine, and detailed studies of urinary composition. Here, investigators made little effort to relate the results of their studies to practical problems. It would appear that they were using the availability of funds and clinical resources to pursue basic research, with little effort made to link clinical findings with pharmacological or physiological ones. Out of wartime necessities came one of the first instances of organized support of basic science by the British government.

Two other diagnostic terms came into being during the war. One was “shell-shock”.³⁹ Initially thought secondary to small cerebral haemorrhages, shell-shock was, by the end of the war, ascribed to psychological causes. Soldier’s heart and shell-shock shared a number of medical and organizational features: both were marked by breathlessness and nervous instability, were less common in men previously accustomed to active, outdoor work, and regularly called into question the possibility of malingering. Both also led to the creation of special boards and special hospitals for study, and created post-war problems for the Ministry of Pensions. It is striking how frequently soldier’s heart is discussed by those writing about shell-shock and how infrequently the reverse is true. The explanation may lie in the somewhat lower status accorded to psychological theories of disease than physiological or anatomical heart disease. Perhaps as a result, shell-shock was often equated with malingering or cowardice, and the remedy was too often the firing squad. While malingering was often an issue with soldier’s heart too, these patients seem not to have faced capital punishment.

The same set of symptoms that was renamed the “effort syndrome” in Great

³⁸ For a lucid description of the concept of failure of cardiac reserve see Lewis, *op. cit.*, note 4 above, pp. 37-40, esp. fig. on p. 39.

³⁹ *Report of the War Office Committee of Enquiry into “Shell Shock”*, London, HMSO, 1922. Martin Stone, ‘Shell shock and the psychologists’, in W.F. Bynum, Roy Porter, and Michael Shepherd (editors), *The anatomy of madness: essays in the history of psychiatry*, vol. 2: *Institutions and society*, London, Tavistock, 1985.

Britain was called “neurocirculatory asthenia” in the United States.⁴⁰ A group of American physicians were sent to Colchester to make recommendations to the Surgeon-General about heart disease in the armed forces. They worked in the same military camps and at times saw exactly the same soldiers as their British counterparts who described these soldiers as having “effort syndrome”. The entity “neurocirculatory asthenia” occurred in American soldiers during mobilization in the USA, while the British soldiers usually became ill only after the stress of battle. Rather than advocating graded exercise and eventual return to duties, as was advised by the British, American soldiers with neurocirculatory asthenia were treated with rest and discharged to civilian life.⁴¹ That the Americans chose to create a different disease with a different aetiology and therapy from the same set of symptoms supports the importance of social settings, military needs, and national styles in the construction of systems of disease.

MINISTRY OF PENSIONS

Military, economic, and political exigencies forced the MRC and the War Office to construct a wartime system of hospitals and physicians in order to deal with soldier’s heart. Although this system was no less necessary after the cessation of hostilities, its function changed from concern with rapid assessment and return of soldiers to concern with the post-war economic drain from thousands of pensioned soldiers. The Ministry of Pensions had been formed in December 1916; in February 1917, it took over administration of disability pensions from the Admiralty.⁴² Long before the war actually ended, British physicians and politicians appreciated the need for accurate assessment of disability and feared the impending financial pressure of soldiers’ pensions.⁴³ Soldier’s heart commanded attention as the third most common reason for disability, and the natural site for that attention was the Colchester Hospital.

By the war’s end, Lewis was the obvious choice to guide the evaluation of soldiers pensioned with heart disease. He was named honorary consulting physician in cardiovascular disease to the Ministry of Pensions, and instituted “intensive courses of instruction in pathology, diagnosis, treatment, and prognosis for pension purposes” to train deputy commissioners for the Ministry.⁴⁴ Some 150 deputy commissioners were trained in these courses, and after the armistice, the War Office continued to send RAMC officers to Colchester. In addition to training examiners, until the spring of 1919, Colchester also functioned as a dispersal hospital for heart cases. Boards of discharge and dispersal sat assessing “cardiovascular” cases for pension purposes almost constantly around the end of the war, in one period of intensive work evaluating some 150 cases per week.⁴⁵

⁴⁰ Samuel A. Levine, ‘The origin of the term neurocirculatory asthenia’, *New Engl. J. Med.*, 1965, 273: 604-605; Harlow Brooks, ‘Neurocirculatory asthenia’, in *The Medical Department of the United States Army in the World War*, vol. 9: *Communicable and other diseases*, prepared under the direction of M.W. Ireland by Joseph F. Siler, Washington, DC, US Government Printing Office, 1928, pp. 559-586.

⁴¹ *Ibid.*, pp. 565, 582-584.

⁴² D.N. Chester, *The organization of British central government 1914-64*, London, Rosken House, 1968, p. 152.

⁴³ *MRCAR*, 1916-17, 3: 75.

⁴⁴ *MRCAR*, 1918-19, 5: 58.

⁴⁵ *Ibid.*, p. 57.

“Soldier’s heart”

Britain’s financial situation was precarious after the unexpectedly long war, and it rapidly worsened. Following the end of the war, the Ministry of Pensions expanded rapidly. By 1920-21, it employed a staff of approximately 18,000 and controlled a budget of £106,000,000, more than any other department of State.⁴⁶ By then, the National Debt had risen to fourteen times the pre-war level and public expenditure had doubled, to thirty per cent of the national income.⁴⁷ With the slump of 1921, the search for economy reached “panic proportions”.⁴⁸ Outside observers of the British pension system noted the very heavy financial burdens it placed on the country.⁴⁹

Once again, attention was focused on soldiers with heart disease. However, rather than occupying hospital beds in wartime, these soldiers were receiving pensions for their disease. Nonetheless, a soldier with heart disease had more chance of significant recovery than one of the many who had suffered penetrating wounds, or had required amputation of an arm or a leg. By the time all of the ex-soldiers had been assessed, over 1.3 million men were receiving pensions. Of these, about nine per cent, or somewhat over 100,000, carried a diagnosis of heart disease. (The percentage diagnosed with “heart disease” remained roughly constant from 1919 to 1928.) But, by the end of the war, the definition of heart disease had changed. Neither the constellation of symptoms that made up soldier’s heart nor the presence of cardiac murmur alone was any longer sufficient evidence for disability (though to some practitioners not yet acquainted with the work at Colchester a murmur alone might still be considered sufficient evidence to label someone an invalid). The new diagnosis of cardiac incapacity was to be based solely on the observed response to effort. With these “new methods of diagnosis and treatment”, large numbers of soldiers were able to return to work and, presumably, would no longer require pensions.⁵⁰

Who was to make the decisions regarding pensions? Paradoxically, despite nearly universal agreement by 1918 that the effort syndrome—whatever it was—was not primarily a disease of the heart, and despite the same unanimity that the word “heart” itself should be studiously avoided in reference or even in proximity to the individuals in question, for fear of unduly alarming them and thereby impeding recovery, it was to “specialists in diseases of the heart” that the Ministry of Pensions turned for assistance in evaluating soldiers claiming to be victims of the disease. And it was to be this group of physicians who later formed the nidus for the development of British cardiology.

Lewis, honorary consulting physician in diseases of the heart to the Ministry, supervised the formation of a unified, rationalized, and financially advantageous system for dealing with heart cases:

Dr. Lewis’s services have been made available at the request of the Ministry of Pensions for work in reorganizing the assessment of cases of cardiovascular disability. During the early part of 1919,

⁴⁶ Sir John A.R. Marriott, *The mechanism of the modern state. A treatise on the science and art of government*, London, Oxford University Press, 1927, vol. 2, pp. 189, 193; ‘Parliamentary intelligence’, *Lancet*, 1922, ii: 1255.

⁴⁷ William Ashworth, *An economic history of England 1870-1939*, London, Methuen, 1960, p. 389.

⁴⁸ *Ibid.*

⁴⁹ ‘Compensation for war disabilities in Great Britain and the United States’, International Labor Office, Geneva, *Studies and reports*: series E, no. 4, 1921.

⁵⁰ ‘Work of the Pensions Ministry’, *Br. med. J.*, 1922, i: 68.

he worked with the Resurvey Boards of the London region, and gave instruction to these boards by means of weekly lectures and demonstrations. . . . on his appointment as Honorary Consulting Physician in diseases of the heart to the Ministry, he recommended that cardiac specialists should be appointed to carry on the instructional and assessment work at the Resurvey Boards under his supervision, and that all heart cases should be seen by the General Boards in special sessions. An outpatient clinic has been inaugurated at University College Hospital for reports upon and treatment of heart cases specially selected by officers of the Resurvey Boards. Recently, on his recommendation, beds have been set aside at the Ministry's hospital at Orpington as a convalescent unit for cardiovascular cases. . . . The assessment and care of pensioners of the cardiovascular class in the London region has thus been organized in such a way that the assessments have been revised and brought to a uniform scale by officers specially trained for the purpose: facilities for special reports and special or convalescent treatment have also been arranged, and the various departments are now in full working order. A feature of the scheme is that all the departments, the Resurvey Boards, the special Cardiac Clinic, and the convalescent unit are closely in touch with one another . . .

It has been estimated that the annual saving upon cardiovascular assessments in the London region alone already amounts approximately to £46,000, and it is understood that the Ministry, acting upon Dr. Lewis's recommendations, have now appointed honorary consultants in diseases of the heart to supervise the work similarly in other regions of the country.⁵¹

This 1919-20 MRC report thus proposed an institutional apparatus that reproduces much that we have come to associate with a medical speciality: a group of physicians with special training in "diseases of the heart", separate facilities, outpatient as well as in-patient, where patients with heart disease would be seen, close communication between all parts of the system, and a financial rationale for this systematic care of patients with heart disease.

The only detailed case study for modern development of a medical speciality remains George Rosen's work on ophthalmology. The MRC system for dealing with heart disease describes three of the requirements Rosen postulated as necessary for speciality development: large groups of patients with specific diseases, specialized hospitals, and the financial resources to support a new group of specialists.⁵² These three conditions held for at least the war and the period immediately following the armistice. The fourth basis for speciality formation in Rosen's model, improved technology, appears, surprisingly, to have played little part in Lewis's plan. Despite his earlier advocacy for the ECG, the effort syndrome was diagnosed and treated by simple, non-technological open-air exercises. Certainly, some of the researchers at Hampstead and Colchester had used other technology, to measure blood pressure with the sphygmograph, heart size with the X-ray orthodiagram, the white blood cell count, the blood carbon dioxide. But these observations were not considered germane to management of patients with the effort syndrome. They were interesting physiological observations, but not necessary for physicians taking care of patients. Machines belonged in laboratories; physicians, it was thought, should rely on their unaided senses.⁵³

THE CARDIAC CLUB

Just as military needs brought together physicians in hospitals to work on soldier's

⁵¹ *MRCAR*, 1919-20, 6: 30-31.

⁵² George Rosen, *The specialization of medicine with particular reference to ophthalmology*, 1944, reprinted New York, Arno Press, 1972, pp. 28, 29.

⁵³ For further discussion of British attitudes towards the ECG see Joel D. Howell, 'Early perceptions of the electrocardiogram: from arrhythmia to infarction', *Bull. Hist. Med.*, 1984, 58: 83-98.

“Soldier’s heart”

heart during World War I, economic pressures led the Ministry of Pensions to gather together British physicians interested in the heart. This group, the Cardiac Club, formed to address specific and (as we shall see) transient post-war problems, persisted long after the rationale for its formation was gone. It eventually became the leading British cardiology group, the Cardiac Society, and as such warrants attention as a case study in early twentieth-century speciality formation.

The honorary consultants Lewis proposed to aid regional directors in assessing cardiac cases were appointed in April 1920.⁵⁴ In 1921, they met for the first time in London, primarily to discuss technical and administrative matters pertaining to the Ministry of Pensions. However, more general matters were considered as well; the group felt that the discussion had been of value “to themselves and perhaps to cardiac science” and that they should meet again under different auspices.⁵⁵ The first organizational meeting of the Cardiac Club was held at Oxford a year later, on 22 April 1922, and the first annual meeting was held at University College London, on 22 November 1922, with Sir Thomas Lewis in the chair. Until transformation into the Cardiac Society in 1937, the Cardiac Club met yearly on the day prior to the meeting of the Association of Physicians of Great Britain and Ireland.

Although they were, by the end of the war, the two physicians most associated with heart disease in Great Britain, neither Lewis nor Mackenzie played an active role in the Cardiac Club. In 1922, after organizing a group of cardiac consultants, Lewis declared “the cream is off the top” and left cardiac research.⁵⁶ He never presented a paper at the Cardiac Club and did no further work for the Ministry of Pensions. When the new Cardiac Society founded the *British Heart Journal* in 1939, Lewis was asked to write the introduction to the first volume. He did so, but clearly from the perspective of an outsider.⁵⁷ Two years earlier, he had changed the title of his own journal from *Heart* to *Clinical Science*, a change in name which reflected a shift in the content of the journal.⁵⁸ Although he played a seminal role in the formation of the Cardiac Club, Lewis chose not to be a part of it. Why not?

Lewis perceived clinical research in a very different way from most Cardiac Club members. After early difficulty in obtaining support for research, since 1916, Lewis had been employed full-time by the MRC. In the 1919-20 MRC annual report, the section on experimental medicine had been separated from the section on cardiovascular diseases. By 1922, he was director of the newly established clinical units at University College Hospital. Having cast his lot with the MRC, Lewis was no doubt attuned to the wishes of his supporters within that organization. And it is clear that one of their priorities was practical results, findings that could be applied at the bedside by the average practitioner. A 1926-27 summary of Lewis’s research praises his early work on the ECG and on soldier’s heart, but then goes on to say: “The work

⁵⁴ John Cowan *et al.*, ‘Some notes on the Cardiac Club’, *Br. Heart J.*, 1939, **1**: 97-103; Maurice Cambell, ‘The British Cardiac Society and the Cardiac Club: 1922-1961’, *ibid.*, 1962, **24**: 673-695.

⁵⁵ Cowan, *op. cit.*, note 54 above, p. 98.

⁵⁶ G.E. Pickering, ‘In memoriam, Thomas Lewis’, *Clinical Science*, 1948, **6**: 3-11.

⁵⁷ Thomas Lewis, ‘Foreword’, *Br. Heart J.*, 1939, **1**: 1-2.

⁵⁸ The last volume of *Heart* contains the final publication of research on soldier’s heart started at Hampstead Hospital. R.T. Grant, ‘After-histories for ten years of 1000 men suffering from heart disease. A study in prognosis’, *Heart*, 1933, **16**: 276-381.

within disorders of the heart, an organ lying deep within the body, compelled the use of complex instruments and methods of great refinement, though happily it was found possible to translate almost all the discoveries so made into simple methods of observation for use at the bed-side.”⁵⁹ The most valuable experiments were those done on patients using simple equipment; the most worthwhile findings were those that could be applied at the bedside. Lewis turned his career to clinical research, leaving behind the heart and the ECG.

James Mackenzie, the only honorary member of the Cardiac Club, was a symbol of the club to many members. Some suggested that the Cardiac Club had been “conceived in Burnley”, Mackenzie’s Lancashire home until 1907.⁶⁰ However, Mackenzie vigorously opposed the concept of a cardiac specialist. The same National Insurance Act that provided funds for Lewis through the MRC had also established the general practitioner in the centre of the health care system.⁶¹ Mackenzie advocated a return to general practice and thought research by the general practitioner in “places remote from hospitals and laboratories” was medicine’s only hope for advancement.⁶² He advised Lewis to take a post as a general practitioner in 1917 (Lewis did not); an American visitor wishing advice from the world-renowned heart specialist was surprised by Mackenzie’s suggestion that his visitor should train for research by entering general practice for ten years.⁶³

Mackenzie, the “patron saint of the general practitioner” thought specialization was an affront to the essential unity of medicine,⁶⁴ calling it “almost a hindrance to progress. This is especially true in medicine. Moreover, a specialist is, by the nature of his calling, a man with a limited experience, and therefore he can have but a limited outlook”. Of men “devoting themselves entirely to the study of affections of the heart”, Mackenzie thought that while this might appeal to the general public, it showed a “complete misconception of the principles of medical practice”.⁶⁵ He thought no more highly of those who regarded laboratory devices, such as the ECG or his own polygraph, as the highest ideal. That conception was “superficial and rudimentary”. He wrote to Lewis: “If medicine is to make any progress at all, the symptoms of disease must be detected by the unaided senses.”⁶⁶

In 1918, Mackenzie left London to found the St Andrews Institute for Clinical Research, based on his concept of research by general practitioners, in St Andrews, Scotland. In his later writings, Mackenzie attempted to define yet another “new

⁵⁹ *MRCAR*, 1926-27, 13: 13.

⁶⁰ Cowan, *op. cit.*, note 54 above, p. 97.

⁶¹ George Newman, *Recent advances in medical education in England*, London, HMSO, 1923, p. 65; Rosemary Stevens, ‘The evolution of the health care system in the United States and the United Kingdom’, in *Priorities for the use of resources in medicine*, Washington, DC, US Government Printing Office, 1977, pp. 13-30.

⁶² Carter M. Smith sen., and Mark Siverman, ‘A letter from Sir James Mackenzie to Dr. Carter Smith (22 April 1924)’, *Circulation*, 1975, 51: 212-217.

⁶³ Mackenzie to Lewis, 25 December 1917, Contemporary Medical Archives Centre, Wellcome Institute for History of Medicine, London; Wilson, *op. cit.*, note 12 above, p. 249.

⁶⁴ Rosen, *op. cit.*, note 52 above, p. 63.

⁶⁵ Sir James Mackenzie, ‘The role of medicine at the beginning of the twentieth century as illustrated by the state of cardiology’, *New York med. J.*, 1922, 65: 61-66.

⁶⁶ Mackenzie to Lewis, 22 January 1919, Contemporary Medical Archives Centre, Wellcome Institute for the History of Medicine, London.

“Soldier’s heart”

cardiology” founded on early detection of disease and the principle of the reflex arc.⁶⁷ Neither this new line of research nor the St Andrews Institute long survived his death.⁶⁸ But the Cardiac Club did survive. Moreover, it prospered; by 1935, no member had resigned and all were present for the annual meeting. Eventually, the club became the first British speciality group devoted to diseases of the heart. This seems quite remarkable. First, the disease the club was formed to evaluate, soldier’s heart, was widely believed to be non-cardiac even before the group was formed. Second, the problem that resulted in the group’s formation, the financial crisis at the Ministry of Pensions, rapidly abated. From expenditures of £106,645,000 in 1921, expenses dropped to £81,500,000 in 1923 and £63,450,000 in 1927.⁶⁹ The club could not survive centred on a cardiac problem of soldier’s heart.

Who were these physicians who gathered in 1922 to form the Cardiac Club? Their careers are sketched in the Appendix.⁷⁰ Many had expressed a particular interest in heart disease even before World War I.⁷¹ Most were in their forties, many had early experience in pathology or anatomy, and many went on to hold chairs in their home institutions.

What was the source of cohesion for the Cardiac Club? If this was indeed an early speciality group, one might expect to see some common themes in their interests, perhaps in research, or some new technology, as Rosen suggested for the ophthalmoscope. One can make three observations about the publications of

⁶⁷ Sir James Mackenzie, ‘A new outlook in cardiology’, *Br. med. J.*, 1924, i: 1-5, 57-61, 104-109.

⁶⁸ It is interesting that, although they were almost three decades apart in age, both Lewis and Mackenzie turned in the 1920s from the study of the heart by graphic methods to the study of human pain. Given their close personal relationship, that both should turn to the same area at the same time seems unlikely to be coincidental, although the reason for their doing so is unclear. Could this relate to the heightened Victorian sensitivity to pain, as discussed by James Turner, *Reckoning with the beast: animals, pain and humanity in the Victorian mind*, Baltimore, Md., Johns Hopkins University Press, 1980? Alternatively, though related, could this be a reaction to the antivivisection forces that remained strong enough to draw public speeches from Lewis, as in *The practitioner’s debt to research*, London, Research Defence Society, 1927? Or did the human brutality and pain in World War I play a role? The question remains unanswered.

⁶⁹ *Annual Reports of the Ministry of Pensions*, London, HMSO, 1922, 1924, 1928.

⁷⁰ Unless otherwise stated, biographical information on members of the Cardiac Club is based on the following:

Carey F. Coombs: *Br. med. J.*, 1932, ii: 1126; *Bristol med.-chir. J.*, 1932, 49: 326-328.

Thomas Cotton: *Br. Heart J.*, 1966, 28: 137-138

J.G. Emanuel: *ibid.*, 1958, 20: 579.

John Cowan: *ibid.*, 1948, 10: 1.

A.G. Gibson: *ibid.*, 1950, 13: 255.

Wardrop Griffith: *ibid.*, 1947, 9: 77.

John Hay: *ibid.*, 1959, 21: 573.

Lord Horder: *ibid.*, 1955, 18: 123; *St Bart’s Hosp. J.*, 1957, 6: 247-250; *Practitioner*, 1963, 70: 532-537.

Sir William Errington Hume: *Br. Heart J.*, 1960, 22: 426; *Lancet*, 1960, i: 117-118; *Br. med. J.*, 1960, i: 132-133.

John E. MacIlwaine: *Lancet*, 1930, ii: 428.

Sir John Parkinson: *Br. Heart J.*, 1976, 38: 1105-1107.

William T. Ritchie: *ibid.*, 1945, 7: 207.

Hubert John Starling: *ibid.*, 1950, 13: 2581.

Kenneth Douglas Wilkinson: *Br. Heart J.*, 1951, 14: 556.

See also, obituaries in Richard R. Trail (editor), *Munk’s Roll. Lives of the Fellows of the Royal College of Physicians of London*, vol. 5: *continued to 1965*, London, Royal College of Physicians, 1968.

⁷¹ Christopher Lawrence, ‘Moderns and ancients: the “new cardiology” in Britain 1880-1930’, this volume, pp. 1-33.

Cardiac Club members. (I am excluding Lewis and Mackenzie from these generalizations.) First, there were few. The entire production of John Cowan, the most prolific, was only thirty-one articles; by comparison, Lewis wrote over 250 articles and Mackenzie over 120. Second, they included almost no papers on animal research or experimental medicine, such as the research carried out at Hampstead and Colchester, or in Lewis's laboratories after the war.⁷² Rather, Cardiac Club members mainly published an occasional case report. The third observation is that the articles covered a wide range of topics. Papers on the heart may be found, to be sure, and Thomas Wardrop Griffith published almost exclusively on cardiac diseases. However, for the rest, case reports on cardiac topics alternated with the 'The treatment of acute lobar pneumonia' or 'Syphilis of the lungs'.⁷³

On two occasions, discussions at the yearly meeting of the Cardiac Club led to publication. Following Hay's discussion of the action of quinidine on heart disease in 1923 and Gibson's on anaemic necrosis of the heart in 1925, the members shared cases which were then published collectively in the *Lancet*.⁷⁴ These two efforts were clearly on cardiac topics. However, other than these case series, the members did not collaborate in investigations, and there is no evidence to suggest that shared research contributed to the survival of the club.

Nor was the primary source of cohesion an instrumental technology. One might think the ECG would have been ideal for that purpose. It was a new technology used to study an accepted cardiac problem, the irregular pulse. Furthermore, the ECG was supplemented by a theory that provided scientific legitimation for its use. However, while Cardiac Club members were frequently instrumental in bringing the polygraph and ECG to their own institutions, they based neither the Club nor their own professional careers on such technology. Several members supervised cardiographic departments; none called himself a "cardiologist". ("Cardiographic" in the 1920s referred to graphic methods of analysing the heartbeat—the polygraph or ECG.) Over the fourteen years of its existence, the Cardiac Club heard thirty-four presentations. Of these, only five dealt with topics amenable to instrumental diagnosis, and only two of these presentations were made in the first ten years.

At their annual meetings, as in their publications, the members of the Cardiac Club addressed a wide range of topics. There was no central theme. Of the thirty-four topics discussed, there were five which dealt with instrumental methods, six on infectious diseases, six on the effect of drugs on the heart (including tobacco and

⁷² Experimental medicine was thus defined by Lewis: "In experimenting we make observations, not upon events that are happening quite spontaneously (observational method), but upon events that are provoked or influenced by the interference of the experimenter." This remains a reasonable definition today. "The relationship of clinical medicine to physiology from the standpoint of research", in *Research in medicine and other addresses*, London, H.K. Lewis, [n.d.]; or *Br. med. J.*, 1932, ii: 1046-1049.

⁷³ John Hay, 'The treatment of acute lobar pneumonia', *ibid.*, 1927, ii: 477; H.J. Starling, 'Syphilis of the lungs', *Quart. J. Med.*, 1939, 32: 381.

⁷⁴ John Hay, 'The action of quinidine in the treatment of heart disease, based on the experiences of certain members of the Cardiac Club', *Lancet*, 1924, ii: 543-545; Alexander George Gibson, 'The clinical aspects of ischaemic necrosis of the heart muscle', *ibid.*, 1925, ii: 1270-1275. Cary Coombs chose to publish separately, along with Geoffrey Hatfield, 'Ischaemic necrosis of the cardiac wall', *ibid.*, 1926, i: 14-15.

“Soldier’s heart”

alcohol), and sixteen (including the six on infectious diseases) on a heterogeneous group of conditions, such as the heart in pregnancy or in pneumonia.⁷⁵

The Cardiac Club eventually became a true speciality group, the Cardiac Society. But, if the club had no unity of research, technology, or practice, was the Cardiac Club itself a speciality group? Perhaps there was no hidden professional focus for the club. The members probably constituted a social group who enjoyed a yearly meeting in which the shared professional discussion was only a minor component. Three retrospective accounts of the club mention that “friendship” was an especially important feature of the group.⁷⁶ While this may be only rhetoric, the fact that all three articles emphasize this point is suggestive.⁷⁷

Soldier’s heart may have been the catalyst that brought the Cardiac Club into being, but it was not the glue that held it together. If friendship was indeed the primary reason for the survival of the club, then this case study demonstrates how a group of physicians bound by social ties can act as the nucleus for later speciality formation. The case study also demonstrates how what was a minor clinical problem in the nineteenth century, heart disease in soldiers, became the focus of attention during the First World War, and how the disease of soldier’s heart was redefined in military hospitals during the war.

For the British government, the redefinition of heart disease in soldiers was “successful”. By “successful” I mean that it was consistent with national needs during World War I, both economically—by reducing the number of days spent in the hospital; and politically—by increasing the number of soldiers already in the army who could return to the front. During the redefinition of “soldier’s heart” as the “effort syndrome”, the aetiology was moved from factors controlled by the army (uniforms and drills) to underlying weakness within the individual (occult infection). At the same time, the Hampstead and Colchester hospitals represented the beginnings of government support of basic scientific research.

The “effort syndrome” reappeared in the Second World War, but that is another story. From the late nineteenth century until the end of the 1920s, heart disease in soldiers serves as a window through which to view a changing medical world, a medical world that ultimately must include war, pensions, and the yearly gathering of men who would, eventually, become cardiologists.

ACKNOWLEDGEMENTS

I would like to thank Mary Fissell, Barbara Gastel, Janet Golden, Christopher Lawrence, and Rosemary Stevens for their comments on this paper.

⁷⁵ To what extent the same variety was represented in the hospital practice of Club members cannot be established without examining members’ case books.

⁷⁶ Creighton Bramwell, ‘John Hay and the founders of the Cardiac Club’, *Br. Heart J.*, 1965, 27: 849-855; Cowan, *op. cit.*, note 54 above, p. 98; Campbell, *op. cit.*, note 54 above, p. 685.

⁷⁷ Evidence for social interactions might be found in the Minute Book of the Cardiac Club and personal papers of the members.

APPENDIX. THE ORIGINAL MEMBERS OF THE CARDIAC CLUB

Name	Age (in 1922)	Education	FRCP	Home	Pathology or Anatomy	Chair
Coombs, Carey F.	43	Bristol; St Mary's Hosp., London	1917	Bristol	demonstrator of pathology, Univ. College, Bristol	
Cotton, Thomas	38	McGill	1931	Montreal and London		
Cowan, John	52	Glasgow; Cambridge	— [FRFPS]	Glasgow	pathology dept., Glasgow Infirmary	Medicine, Glasgow
Emanuel, J.G.	51	Birmingham	1921	Birmingham	resident pathologist, General Hospital, Birmingham, 1900	Medicine, Birmingham
Gibson, A.G.	47	St Thomas Hosp., London; Oxford	1913	Oxford	asst. pathologist to Infirmary, 1911	
Griffith, Thomas Wardrop Hay, John	61 45	Aberdeen Liverpool	1908 1915	Leeds Liverpool	Professor Anatomy, Aberdeen medals in anatomy and physiology Univ. College, Liverpool	Medicine, Leeds Medicine, Liverpool
Horder, Lord	51	St Bartholomew's Hosp., London	1906	London	junior and senior scholarships in anatomy and physiology, St Barts, 1891	
Hume, Sir William Errington	43	Cambridge; London Hosp.	1917	Newcastle		Medicine, Newcastle
Lewis, Sir Thomas	41	Univ. Coll., Cardiff; Univ. Coll. Hosp., London.	1913	London		
MacIlwaine, John E.	48	Belfast		Belfast		Materia Medica, Queen's Univ.
Parkinson, Sir John	37	Freiburg; London Hosp.	1923	London	prizes in anatomy and physiology, London Hospital	
Ritchie, William T.	48	Vienna, Edinburgh	1903	Edinburgh	pathologist Leith Hospital 1902-6. Asst. path Royal Infirmary 1906-10	Medicine Edinburgh
Starling, Hubert John Wilkinson, Kenneth Douglas	48 36	Guy's Hospital Birmingham	1929	Norwich Birmingham		Pharmacology and Therapeutics, Birmingham.