A Century of Cardiomythology: Exercise and the Heart c.1880–1980

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Summary. The relationship between health and exercise involves risks as well as rewards. This article focuses on heart disease and the marathon to show how doctors have negotiated that relationship over a century. Three distinct changes in biomedical attitudes towards vigorous exercise are outlined. First, the mid-Victorian interpretation of pathological hypertrophy of the heart was overturned at the end of the nineteenth century. Secondly, hypertrophy was reinvented as a beneficial physiological adaptation in the 1940s and 1950s. Thirdly, these claims of distinctiveness were challenged by the leisure revolution. Sports doctors and cardiologists reinvented exercise as a drug that could only be safely used with the guidance of a medical professional. Medicalising sport reduced its risk and maximised its reward, both to the individual and the state.

Keywords: sport; sports medicine; exercise; cardiology; Athlete’s Heart

Both the marathon and the heart are metaphorically powerful objects. While the latter is medically significant and culturally loaded, the marathon marks a subtle barrier between elite and regular sporting activity. It is also named after a famously fatal bout of exercise, when the first marathoner—Pheippides—ran himself to death. With sensational collapses (and the first Olympic fatality) occurring in marathons in the early twentieth century, Pheippides’s cautionary tale continued to have popular resonance; the marathon was dangerous and was associated with the sudden death of young, fit men. Less dramatically, it was sometimes blamed for long-term chronic cardiac illness.

As objects of historical enquiry, diseases of the heart have successfully been used to illustrate larger arguments about the development of cardiology as a discipline, and the history of medicine more generally.1 Howell and Lawrence’s work highlights the role of measuring technology and laboratory science in creating and defining illness, while Daly has written on the ambiguity of cardiological diagnosis, and the social construction of ab/normal boundaries.2 Otherwise, studies of the historical connections between heart disease and exercise have largely been confined to the pages of biological and medical journals.3 Similarly, there is a dearth of historical literature on sports medicine in the UK.4 In this article, the relationship between the pathology/physiology of the heart

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1Steel 2007; Whorton 1982; Howell 1985.
2Daly and McDonald 1997; Daly 1989; Lawrence 1985; Howell 1984.
3Whorton 1982 is a notable exception. Otherwise, see Rost in Rost 1987; Rost 1990, 1997.
4Heggie 2008; Welshman 1998; Sheard 1998; Waddington 1996.
and exercise will be considered, linking a twentieth-century disease phenomenon and an iconic sport, often medically constructed as dangerous to health, to illustrate a broader history of sports medicine and body culture. In the closing section, issues of risk and responsibility, particularly in relation to sport as a public health measure, will be specifically considered. In particular, I will trace the career of the Athlete’s Heart, from pathology, through fiction, to physiological adaptation.

The major challenge to any historian of heart disease and exercise is largely one of categories and definitions; a problem also encountered by historical actors in this story, where some disputes in the medical press about exercise and hearts were resolved when both parties realised their interpretations of key terms, such as ‘athlete’ or ‘hypertrophy’, were wildly different. The title of this article, ‘Cardiomythology’ is taken from an editor’s tag line for a letter published in the New England Journal of Medicine in 1979, querying the association between marathon running and healthy—or unhealthy—hearts. The ‘mythology’ referred to both positive and negative interpretations of the link between exercise and heart disease, and also to the ambiguous interpretations of statistical data. I am therefore imposing some of my own definitions and limitations. First, I place an emphasis on the marathon and other forms of endurance sport, not least because the marathon and its participants played a central role in physiological and cardiological research in the twentieth century. Secondly, I will use the phrase ‘Athlete’s Heart’ just as the historical actors use it—not a single clinical disease or physiological feature, but a range of symptom-complexes and anatomical phenomena and, in some cases, an entirely fictional ‘Victorian myth’. Finally, I will discuss two distinct risks of exercise—sudden death and chronic disablement.

There are few moments in the history of British medicine from the mid-nineteenth century where we can identify a single, consensual view of the relationship between exercise and heart health. At the very least, each time a new method of investigation was introduced into cardiology it was necessary to renegotiate the meaning of this technique with regard to exercise, to sportsmen and the diseased heart. What is presented here is, unless otherwise stated, the majority or mainstream view. For the period to around 1920, this differs in some significant features from previous accounts by Park and Whorton. While these authors argue that medical professionals expressed extreme caution about the effect of exercise on the heart, this article will show that by 1900 most doctors accepted that a fairly high level of activity was not only safe, but ‘actually indispensable to [the heart’s] normal development’. This difference of opinion perhaps lies in the sources: this paper draws from the pages and records of

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5Rothstein 2003.
6See, for example, Plesch 1932.
7Rennie and Hollenberg 1979.
8One final limit: the male pronoun. Sports medicine is dominated by men both as practitioners and patients throughout the time period considered here; the diagnostic dilemma of the female athlete’s heart was considered—even into the 1990s—to be quantitatively different to that of the male Athlete’s Heart. It is the latter which is exclusively considered in this paper. Pelliccia et al. 1996.
9Whorton 1982; Park in Berryman and Park (eds) 1992; Park 1997.
10Schmidt and Miles 1901, pp. 222–3. Original emphasis.
the British medical and scientific profession, while previous studies have tended to use an amalgam of publications and research from across Europe and North America.\textsuperscript{11} Considered in isolation, the British literature seems less concerned about the possible negative health effects of vigorous exercise than previous historians have suggested.\textsuperscript{12}

Despite these complexities, the trajectory of the relationship between heart disease and exercise can be simply stated. Around the mid-nineteenth century, the heart was at risk from extreme exertion; it could become strained, leading to dilatation and hypertrophy, which could result in both sudden death and long-term disability. From the 1860s onwards, this view was increasingly challenged by epidemiological evidence and argument. By the turn of the century a new consensus emerged picturing the \textit{healthy} heart as a powerfully adaptable and flexible organ, which could temporarily enlarge or change its function to cope with extreme exercise, while remaining fundamentally unaltered. Now only the weakened or \textit{unhealthy} heart was at risk of sudden failure or strain—those without congenital malformation or predisposition to disease could safely take part in exercise. This was codified by the introduction of screening tests for sport, from schoolboys taking part in cross-country running to Olympic marathoners.\textsuperscript{13} These tests were not to identify the strong few best fitted for endurance sports, but to weed out the weak few who could be harmed by exercise.

It was not until the late 1940s that the enlarged, slow-beating heart of the athlete became recognised as a physiological feature unique to athletes (either present from birth or acquired through training). This coincided with the professionalisation of sports medicine in the UK, and across much of Europe and North America, emerging in combination with a new conceptualisation of the athletic body as different from the ‘norm’—specially adapted for sport and exercise. Now the Athlete’s Heart was real and physiological, yet not normal. This abnormality proved problematic from the 1970s with the significant increase in participation in sport and exercise, notably in jogging, 5 and 10 kilometre runs and even the marathon. Discussion of hearts and exercise turned to the question of whether such sport was good or bad for a ‘normal’ person. While some argued for the absolute protective quality of heavy endurance exercise, others warned of lay bodies being damaged by participation in what should rightly be considered a specialised and elite activity. Tensions between the risks and rewards of sport were particularly acute in Britain, where an extensive welfare system had to carefully rationalise the health benefits of exercise against the cost of morbidity or mortality caused by sporting activity.

**The Shift from Pathology to Physiology**

While consensus is hard to find, we can generalise that in mid-Victorian Britain there was an attitude of sceptical medico-scientific wariness towards strenuous and vigorous

\textsuperscript{11}The assertions of Bassler, an American cardiologist, in the 1970s are given some space in this article because these generated significant reactions in Britain and therefore warrant inclusion. See also Maron and Horvath 1978.

\textsuperscript{12}The relative non-involvement of British doctors and physiologists in anything other than elite and professional sport continued throughout the twentieth century. This is obviously too large an issue to be adequately discussed here. The absence of compulsory screening for sport in Britain can be compared to fairly rigorous state-controlled certification for even amateur and leisure/pleasure sport in other European countries. See Anon. 1989; Commandré and Fouré 1983a, 1983b.

\textsuperscript{13}Anon. 1909a; British Olympic Council 1908.
activity, particularly in regard to its effects on the heart, but also on morality and character. The Victorian ‘invention’ of the amateur-gentleman in sport is discussed at great length elsewhere.\textsuperscript{14} This process is often constructed in terms of class conflict, where the ‘play up and play the game’ attitude is enforced as a protection against fears of violent (or disruptive) working-class physicality. It is notable, however, that medical anxieties over exercise and health in this period seem to focus almost exclusively on the ‘new’ vigorous exercise of the middle and upper classes, particularly the University Boat Race, rather than popular working-class and professional sports such as boxing or pedestrianism.\textsuperscript{15} This may in part be a commercial phenomenon; these new gentlemanly sportsmen were generally literate and had a disposable income, so it was for them that the training manuals and books of medical advice relating to sport, a booming market at the end of the Victorian period, were intended.

The challenge vigorous exercise posed to the body was expressed through the notion of ‘strain’:

\begin{quote}
the human frame is constructed to bear an amount of strain specified by the laws of nature, and . . . if the amount of strain be exceeded by an appeal to violence, the entire vital system suffers in proportion to the excess.\textsuperscript{16}
\end{quote}

Specifically the heart was at risk of dilatation—expanding beyond its natural capacity—which could lead to a compensatory hypertrophy (enlargement). Hypertrophy, dilatation and disproportionate enlargement were all recognised symptoms of heart disease, so the athlete who presented with these features was just one among many cardiac patients. The story of violent strain pushing beyond the body’s natural barriers of performance, a theory strongly grounded in physiological understandings of the body, explained why and how an otherwise fit athlete could become diseased.\textsuperscript{17}

Yet while the physiological evidence seemed clear, the epidemiological evidence was ambiguous. One of the most enduringly famous and widely-referenced works on health and sport, J. E. Morgan’s \emph{University Oars}, was published in 1873, and it was prompted by concerns voiced in \textit{The Times} about the possible deleterious effects of the University Boat Race. Morgan, a physician at the Manchester Royal Infirmary, traced the life histories of rowers from the Oxford and Cambridge rowing teams. He concluded that there was no evidence for shortened life-expectancy, for tendency to heart-disease or for increased risk of sudden death.\textsuperscript{18}

Morgan’s conclusion—that only the weak, diseased or intemperate are at risk from exercise-mediated heart disease—became the majority opinion by the end of the century. The first medical treatise on athletic training was also published in 1873, a fairly thin pamphlet on \textit{Exercise and Training: Their Effects upon Health} by Dr R. J. Lee.

\begin{thebibliography}
\bibitem{Holt} Holt 1989, Section 2; Mangan 2000.
\bibitem{The Universities Boat Race} The University Boat Race is a rowing competition between opposing crews from Oxford and Cambridge universities; the first race took place in 1829 and has been held annually (in peace time) on the River Thames since 1856. ‘Pedestrianism’ is a catch-all term for long-distance walking events, popular at the beginning and end of the nineteenth century and strongly associated with gambling. See Osler and Dodd 1977.
\bibitem{Moderation} ‘Moderation’ 1867.
\bibitem{Tansey} Tansey in Bynum and Porter (eds) 1993.
\bibitem{Morgan} Morgan 1873, p. 38.
\end{thebibliography}
Lecturer in Pathology at the Westminster Hospital. Lee is more ambivalent than Morgan, suggesting that professional sportsmen (specifically pedestrians) sometimes ‘at an early age paid the dearest penalty for their want of prudence’, that is exercising to an extreme and damaging their hearts. That said, despite the fact that they presented with the presumably pathological ‘immense hypertrophy of the heart’, these professional athletes actually seemed to escape the expected consequences of degeneration of the large vessels of the heart. Furthermore, Lee argued:

[to suppose that any injurious effects are produced on the constitution of a healthy man by the amount of training required for the performance of any of the exertions demanded by the sports in vogue at our Universities I have no hesitation in asserting is an error.

These publications changed minds. In 1873, partly influenced by the evidence in University Oars, a leading heart expert, Sir Thomas Clifford Allbutt, stated in a seminal work on heart disease that, although he had once argued ‘that bodily exertion had more to do with the causation of cardiac…disease than was generally admitted’, he was now of the opinion that:

the kinds of physical exertion proper to the upper classes are less commonly followed by cardiac disease; exercises such as gymnastics, field sports, Alpine climbing, rowing and the like, seem to be wholly beneficial and only injurious to persons of imperfect constitution.

Like Morgan, Allbutt argues for dangers only to those with a predisposition or weakness. That the exertion of physical labour causes heart disease, while the sports of the upper classes do not, he puts down largely to other life-style factors (particularly intemperance) and to the psychological boredom of repetitive manual work. Vigorous physical exercise was not harmful per se. Despite these, and similar, statements of the safety of sporting events to all but the morally suspect or physically weakened, some historians argue that the late nineteenth century was a period of caution. In particular, Benjamin Ward Richardson’s assertion that ‘there is not in England a trained professional athlete of the age of thirty-five, who has been ten years at his calling, who is not disabled’ is quoted as evidence of the cautious attitude towards sport and disease. It is worth emphasising the limitations of the words ‘professional’ and ‘trained’; Britain’s largest professional sport, Association Football, only became formally professionalised in 1885, and when Richardson first made his claim the number of ‘trained professional athletes’ was otherwise incredibly small, limited mostly to a handful each of pedestrians, cyclists, some cricketers and boxers.

19With due respect for Ryan’s claim for an Encyclopaedia entry from 1898, see Ryan and Allman 1974, p. 22.
20Lee 1873, p. 30.
21Lee 1873, p. 31.
22Lee 1873, pp. 7–8.
23Allbutt 1873, p. 101.
24Whorton 1982; Park in Berryman and Park (eds) 1992; Park 1997.
25Richardson 1889, p. 181.
26Vamplew 2004.
Terminology is essential. In 1880, the *Lancet* held a ‘Commission on Athletics’, publishing two long articles on the effects of exercise on health and moral development. Generally approving of university athletics, the authors were concerned about the ‘weaker’ members of society, those living in crowded urban areas and school children. Their assertion that ‘[w]ith respect to adults, the rule should be that exercise should stop short of fatigue’ can seem ludicrously over-protective, until the definition of ‘fatigue’ is discovered a few sentences later—‘[p]anting, sighing respiration, rapid and irregular action of the heart, cold sweat, and frequently giddiness and indistinctness of vision’.27

Secondly, it is not clear from a limited quote how much Richardson’s interpretation of the dangers of the Athlete’s Heart differs from that of the mid-century. Instead of sudden shock leading to strain, he asserts that the heart has become enlarged by exercise, and that this is a physiological reaction to hard work—the athlete has achieved a ‘state of perfection [that] is at best artificial’.28 It is only in later life, when the work is reduced and a ‘normal’ lifestyle regained, that the physiological adaptation becomes a pathology. The overdeveloped strong heart would ‘remain in strength out of all due proportion greater than the rest of the active moving parts of the organism’.29 This idea, that regular, vigorous exercise could lead to a permanent adaptation in the heart, did not become the consensus view for another generation. Richardson, quoted out of context, is hardly a good example of contemporary thought in relation to exercise and the heart.

Other sources mobilised to provide evidence for widespread medical caution are the editorials about football in the *Lancet* and *BMJ* around 1900.30 These can be superficially read as medical caution in the face of violent, working-class physicality. But they are more accurately characterised as an expression of general fears about the degenerative forces of urbanisation and industrialisation.31 One editorial from 1883 discusses two recent deaths on the football field, one of a 23-year-old player, and one of an umpire:

> It is not so much the severity of the game itself that we quarrel with, but the fact that the exertion has to be made by young men and lads whose ordinary mode of life does not at all prepare them for such exertion. If the game were followed every afternoon, the evil would be lessened, or would cease.32

It is the degenerate urban lifestyle which is being critiqued here, not exercise per se. If anything, more exercise is needed to improve the health of the population.

Ironically, one of the first specific defences of the Athletic Heart was in a book dedicated to Richardson by the German physician, George Kolb (whose work was translated into English in 1893).33 Kolb expected ‘to find nothing but invalids among sporting gentlemen’, but ended up concluding that ‘chronical muscular exertion causes a normal hypertrophy of the heart and the muscles’.34 Further, the apparently pathological

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27 Anon. 1880, p. 219.
28 Richardson 1889, p. 181.
29 *Ibid*.
30 See, in particular, Park 2001.
31 Hoole 1891, p. 4.
32 Anon. 1883.
33 Kolb 1893.
34 Kolb 1893, p. 49.
‘symptoms’ of a slow heart beat, high blood-pressure and a strong pulse were all ‘normal’ features of the body in training, which would diminish naturally as the body becomes untrained. Of all those Kolb tested, ‘scarcely one single man was without an entirely normal and healthy circulation of the blood’, even after they had stopped competing.\(^{35}\)

Of course, there were dissenting voices. At a debate at the Medical Society of London in 1892, several arguments were made for the dangers of competitive and endurance sports. That said, the main critic of sport—Dr W. Collier of Oxford—used the work of Allbutt as evidence, but only the early condemnations of exercise, making no reference to his revised ideas of sport and exercise after 1873. Noticeably too, some ‘blame’ for heart disease was placed upon moral weakness, such as over-competitiveness, the physical damage of venereal disease, or other predispositions to disease.\(^{36}\) Again, the anti-sport argument is more nuanced than it might appear at first, and just as Allbutt and Kolb had changed their minds about the link between heart disease and exercise, so too did Collier. By 1909, he was arguing that ‘the hypertrophy of the heart which is found in the athlete [is a] physiological reaction natural and beneficent’.\(^{37}\) By the first decade of the twentieth century, the sickly Athlete’s Heart had been reduced to a myth. Medical discussions in Britain about collapsing runners largely dismissed cardiac events as the sole cause. Instead, they focused on more general system failures, local temperatures and other environmental influences.\(^{38}\) It was still possible that weakened, unhealthy hearts might react adversely to extreme exercise, which is why compulsory screening was introduced for the cycling and marathon events at the London Olympiad in 1908.\(^{39}\)

There is an argument from absence to make about the Athlete’s Heart at the turn of the twentieth century. The medical literature remains relatively silent. Broadbent’s *Heart Disease* (1897) discusses hypertrophy as a diagnostic tool, but is unclear whether all hypertrophy is to be considered pathological; it also recommends light exercise as treatment and prevention for heart disease.\(^{40}\) Likewise, Colbeck’s *Diseases of the Heart* (1901) makes no mention of physiological hypertrophy.\(^{41}\) Mackenzie’s seminal *Diseases of the Heart* (1908) limits discussion of Athletes’ (and Soldiers’) Heart to a single paragraph:

> there is a series of cases in which it is difficult to account for the rapid pulse, especially when it occurs in the apparently strong in the prime of life. In these cases there is generally a history of hard work or periods of excessive muscular exertion. … The heart overstrain is most evident amongst those with a tendency to obesity and who indulge rather freely in alcohol.\(^{42}\)

\(^{35}\) Kolb 1893, pp. 59, 31. Original emphasis.

\(^{36}\) See the evidence of Drs Collier and Sanson: Hutchinson 1892.

\(^{37}\) Anon. 1909b, p. 890.

\(^{38}\) Anon. 1908.

\(^{39}\) Some concerns about the marathon were inspired by the use of drugs and stimulants in the previous official games in St Louis (1904); using a substance which ‘artificially’ alleviated fatigue could allow the human body to go beyond its natural limits and cause strain. For a lurid description of drug use in the 1904 Olympic marathon, see Lucas 1905, p. 53.

\(^{40}\) Broadbent and Broadbent 1897.

\(^{41}\) Colbeck 1901.

\(^{42}\) Mackenzie 1908, pp. 126–7.
We can interpret this as a consensus, albeit one of silence, about the Athlete’s Heart—it was no longer a serious threat to the cardiological health of Britain.

Collier described a natural form of hypertrophy of the heart caused by exercise, but the most common statement (at the beginning of the twentieth century) about Athlete’s Heart was that ‘the healthy heart does not hypertrophy’. These two interpretations are not forms of double-think; the latter phrase has the modifier ‘excessively’ implied. If exercise or training enlarged the heart, then it did so in proportion to the muscular growth elsewhere in the body; it was proportional, normal and healthy. The weedy bank clerk who concerned the Lancet was built up into the robust athlete, passing from a below-average health to healthy normality—not supernormality. The enlarged hearts recognised as physiological features of marathon runners today are explicitly not what is being described by cardiologists, physicians and physical education experts in the first two decades of the twentieth century.

The shift to a robust, adaptable heart and the dismissal of ‘traditional’ markers of pathology in favour of a more functional approach to cardiac disease is also demonstrated in Howell’s accounts of Thomas Lewis’s work on ‘Soldier’s Heart’ during the First World War. The connections between the young, fit, male bodies of soldiers, and of athletes are obvious; while they were essentially different diseases, the non-existence of the Athlete’s Heart was used as evidence in discussions of the possible aetiology of Soldier’s Heart and other wartime cardiac illnesses. In a 1917 article, Adolphe Abrahams, Britain’s leading sports doctor (and founder of the first British sports medicine organisation), stated that:

\[\text{[f]or eight years there has been practically no prominent athlete in any country in Europe...whom I have not had an opportunity of examining....I have been hunting the ‘athletic heart’ all [that] time in sprinters, middle-distance runners, marathon runners, and have never caught it.}\]

Abrahams continued to make this assertion through the interwar period, arguing in 1928 that physiological enlargement could never be proven; first, heart size varied from man to man, so an ‘enlargement’ could never be diagnosed unless the subject had been carefully examined before as well as after training; and, secondly, because ‘the method of estimating size by percussion involves the personal factor too largely for absolute accuracy to be possible; and even in radiology the personal factor is not to be ignored, to say nothing of technical difficulties’.

But the history of the Athlete’s Heart is a history of U-turns. Abrahams’s previous unsuccessful hunt for the Athlete’s Heart ended in 1946 with the autopsy of a long-distance cyclist who had died at the age of 78 from a ‘malignant growth of the thyroid’. Despite Abrahams’ previous experience that he had ‘never found occasion to doubt that the healthy heart never hypertrophies’, the autopsy revealed not just a strong, muscular heart, but a ‘considerably hypertrophied heart...with complete absence of any disease...and a condition of exceptional healthiness of all viscera for a man of his

43 Howel 1985.
44 Abrahams 1917.
45 Abrahams 1928.
46 Abrahams 1946, p. 566.
Abrahams was forced to conclude that it was at least possible that athletic training for endurance events created a clinically distinct organ, or that those born with unusually large hearts were predisposed towards extreme exercise. Whichever was the case, there was a new, abnormal heart in the bodies of some athletes, who were not just healthy, but ‘constitutionally fitted for protracted exercise’.\footnote{Ibid.}

**Putting the Athletic Heart in an Athletic Body**

Abrahams’s view was not entirely novel; possible associations between the enlarged hearts of greyhounds or race horses and those of athletes had been suggested as early as 1897.\footnote{Pugin 1897.} With the benefit of hindsight, other pioneers of this view of enlargement were identified: ‘[m]ore than 25 years ago’, wrote a correspondent to the *Lancet*, ‘I remember the late Dr Strickland Goodall saying, during one of his physiology lectures, that no-one whose heart did not show hypertrophy could be a successful athlete’.\footnote{Herxheimer 1946.} Once again, this view was not universal, even amongst cardiologists—in 1950, Dr Terence East, the physician in charge of the Cardiology Department at King’s College Hospital, insisted that ‘in a healthy heart anatomical changes are not caused by athletics’, but this view became increasingly marginalised in the 1950s.\footnote{East 1950.} So the Athlete’s Heart became a clinical phenomenon once more, albeit a physiological and not a pathological manifestation of the effect of vigorous exercise upon the heart. Much of the clinical and experimental evidence produced in favour of the physiological Athlete’s Heart came from long-distance runners and marathoners, who became favoured guinea pigs in physiological experiments from the late 1920s. This was partly inspired by the publication in 1927 of *Muscular Movement in Man* and *Living Machinery* by the Nobel Prize winning physiologist, A. V. Hill, a long-term advocate of the value and experimental usefulness of athletes as laboratory objects. Additionally, the first international sports medicine organisation was founded in 1928, and began to organise research programmes coinciding with the Olympic Games.\footnote{The Association Internationale Medico-Sportive was founded in February 1928 and renamed the Fédération Internationale de Médecine Sportive (FIMS) in 1934. La Cava 1956.} The first of these involved systematic examination of competitors at the 1928 Amsterdam Olympiad, and included Hill and two researchers from Manchester who conducted cardio-vascular studies on runners.\footnote{Bramwell and Ellis 1928; Abrahams (ed.) 1928, pp. 265–6.}

The Olympics were not the only convenient gatherings of experimental subjects. In 1958, two British physicians, F. W. Beswick and R. C. Jordan, examined athletes at the Commonwealth Games in Cardiff using an ECG.\footnote{The National Archives (hereafter TNA), FD23/89, *Archives of the Medical Research Council. ‘Proceedings of a Meeting on the Psychological and Physiological Aspects of Athletics’,* 19 June 1959.} Their conclusion was that athletes who appeared, using ‘traditional’ diagnostic methods, to show serious heart disease often went on to produce exceptional athletic performances. In other words, athletes posed a clinical dilemma:
considered as a group, highly trained athletes... present certain important characteristic features that distinguish them from the untrained and throw some light on their cardiovascular adaptation to repeated severe exercise.\textsuperscript{55}

The normal body, and normal readings from medical technology, were no longer appropriate measures for the athletic body.

There are three reasons why the late 1940s and 1950s should have seen a shift from hypertrophy as a myth to the emergence of the adapted, unique athletic heart. First, and most pragmatically, Abrahams’s discovery was autopsy-based, and the late 1940s and 1950s would have been the first years where the older bodies of marathon runners and long-distance cyclists (sports which had gained popularity from 1880 onwards) would have become available for autopsy. Secondly, since the 1928 Olympiad regular, organised, systematic testing and experimentation had taken place at most large international sporting events. It is more likely for the Athlete’s Heart to be ‘caught’, to use Abrahams’s phrase, in this atmosphere of scrutiny. Finally, the clinically distinct athletic body was necessary for an emergent medical specialism. In 1952, the UK’s first sports medicine organisation, the British Association of Sport and Medicine (BASM), was founded.\textsuperscript{56} In the preceding years, men had begun to emerge who self-identified as experts in sports medicine, and who were being trained in an educational system which was increasingly recognising the value of specialists and experts, if not necessarily formal fragmentation into discrete specialisms (Sports Medicine was formally recognised as a distinct specialty in 2005).\textsuperscript{57}

But before one can be recognised as a formal specialty, one must demonstrate specialist knowledge, and to do this one needs a special object of study. Athletic disorders are not characterised by disease type (like oncology) or body region (ear, nose and throat), or tissue (orthopaedics). Instead, like geriatrics and paediatrics, sports medicine described a clinically-distinct patient body—the athlete. It can be no coincidence that specialist medical groups like the BASM formed at exactly the same time that the athletic body began to be described in the literature as being different or abnormal. Indeed, the first regional meeting of the BASM, in 1961, took the topic ‘Are Athletes Different?’—and the papers presented overwhelmingly argued ‘yes’.\textsuperscript{58} In the particular instance of the Athlete’s Heart, the opinion of experts was now vital, as the physiology of the athlete could be mistaken for the pathology of a ‘normal’ body.\textsuperscript{59}

The heart was not the only part of the athlete’s body to be characterised as clinically distinct. In the same time period, spleens, kidneys, muscles, tendons, even hormones were all investigated in connection with exercise.\textsuperscript{60} The conclusion drawn was almost universally that the trained athlete was different. Exactly how s/he differed was still to be

\textsuperscript{55}Beswick and Jordan 1961, p. 128.

\textsuperscript{56}Wellcome Library (Archives and Manuscripts Collection), SA/BSM, British Association of Sport and Exercise Medicine Archives. Minutes of the BASM. First Meeting of the Executive Committee, 23 June 1952.

\textsuperscript{57}Weisz 2006. See, in particular, ch. 9.

\textsuperscript{58}Archives of the British Olympic Association 34.2, Proceedings of Meetings held at Loughborough Training College, 1961–3, Report by D. T. Oakely on the Meeting at Goldsmith’s College London on the Medical Aspects of Boxing, November 1963.

\textsuperscript{59}Abrahams 1951, p. 1136.

\textsuperscript{60}In particular, the kidney mirrors the story of the Athlete’s Heart. See Collier 1907; Anon. 1939; Gardener 1971.
negotiated, and much research done in the 1950s and 1960s aimed to quantify and characterise the various unique features of the endurance athlete. So, while the Victorian Athlete’s Heart was pathological, the Athlete’s Heart of the mid-twentieth century was physiology masquerading as pathology.

By the late 1960s, however, the Athlete’s Heart was beginning to be part of a new dilemma. On the one hand, doctors were beginning to accept the ‘exercise hypothesis’, concluding that ‘there is an association, moderately close and moderately consistent, between occupational inactivity and the incidence, prevalence and fatality of [Coronary Heart Disease]’. But on the other hand, reports of, and concerns about, the negative impact of vigorous exercise began to increase. Originating largely in the US media, but quickly taken up in the UK and Europe, case studies of those who had ‘run themselves to death’ were printed, and cautionary lines taken on the relative dangers of long-distance running. While the anticipated leisure revolution of the late twentieth century was perhaps less revolutionary than had been predicted, participation in sports and personal exercise regimes did significantly increase, even in previously elite sports such as the marathon. Ten marathon races were organised in Britain in 1970, rising to 47 in 1981, the year of the first London Marathon, and nearly doubling in 1982 to 97. Were these ‘amateur’ marathoners running the risk of heart disease?

The Marathon as Medicine?
The confusion at the centre of the Athlete’s Heart is the difference between normality and abnormality; were the hearts of athletes unhealthy? And if they were the epitome of good health, what would happen if unhealthy hearts tried to mirror their activity? In 1970, the 18th World Congress on Sports Medicine was held in Oxford, with a panel dedicated to the problem of ‘death in sport’, with a specific focus on vigorous exercise and heart disease. While inadequate training, a hot day, or equipment failure all contributed to sudden death, in the case of the heart, congenital predisposition or underlying occult disease were also blamed. In theory, pre-participation screening and ongoing health assessment could identify and exclude those at risk. But sports cardiology insisted that athlete’s hearts did not look or sound like ‘normal’ hearts—so how could they be effectively assessed? Some physicians and athletes argued that participants were being barred from sport because their inexperienced family doctors could not tell the difference between a pathological ECG and an athletic ECG.

If it was still difficult to judge if the heart of an athlete was healthy, it was almost impossible to tell if athletics was healthy for the heart; the athlete was ipso facto a poor model for the normal. How could practitioners tell who could safely engage in training? If athlete’s clinical presentations were, by definition, abnormal, how could screening tests distinguish between the pathological and the physiological? To further complicate the picture, evidence

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61Eichner 1983; Anon. 1969a, p. 1187.
62Anon. 1969b.
63Centre for Sports Science and History, Birmingham University: Special Collections rpgGV 1065.23.G7M34. ‘A Study of the Temporal and Regional Aspects of the English Marathon between 1908 and 1985’ (Dissertation as part assessment for the degree BSocial Sciences (Hons) by Neil MacGuinness), Fig. 2.3.
64Anon. 1970.
65See the long list of ‘special features’ in Van Ganse et al. 1970, p. 163.
was emerging that structured exercise could actually benefit patients with heart disease. There are two essential questions here; ‘are athletes healthy?’ and ‘is athletics healthy?’.

In 1972, one of the boldest claims about exercise and health conflated the two. Thomas Bassler, a Californian cardiologist, wrote to the *New England Journal of Medicine* to comment on a series of reports and letters on the topic of death during jogging, stating that ‘a search of the literature has failed to document a single death due to coronary atherosclerosis among marathoners of any age’. In 1975, Bassler simplified this conclusion: ‘The American Medical Joggers Association has been unable to substantiate a single ischemic heart disease death among marathon finishers of any age.’ Importantly, this was to be taken not as a coincidence, but as evidence of correlation between marathon running and the avoidance of coronary heart disease.

The scepticism about exercise which, as discussed above, historians have tended to see in Victorian Britain, is in fact more evident in the late twentieth century. Many doctors, scientists and cardiologists wrote with theoretical refutations and case studies to contradict Bassler’s assertions of the protective nature of marathoning. South African heart specialist, Dr L. H. Opie, argued in the *Lancet* that Bassler’s endorsement of the marathon as a heart-safe event was irresponsible, as in any population there would be a ‘minority predisposed to heart-attacks’. Even amongst those who were not pre-disposed, ‘[if they] consider themselves immune to atherosclerosis...they may ignore the symptoms of impending heart-attacks’. This international debate was playing out at a particularly tricky moment for sports medicine in Britain. The European-wide ‘sport for all’ movement had driven political developments in the UK, which had increased access to sport and leisure facilities. Governmental departments responsible for spending on health or sport were wary about connecting exercise to health benefits, considering the evidence inadequate. While it was clear that a sedentary lifestyle was a risk factor for heart disease, it was unclear how much or what sort of exercise was rewarded with reduced morbidity. While the Sports Council—a body set up in 1965 to channel funds into sport—investigated the potential of Sports Injuries Clinics to deliver better specialist care, both sports doctors and the Department of Health and Social Security (DHSS) remained wary of this specialised demand on limited NHS funds. For the proponents of exercise, it seemed hard to argue for increased sports funding on the grounds of public health benefit, and at the same time demand money to treat sports injuries—both chronic and acute. For the NHS, the view is best summed up by an advisor to the DHSS who wrote: ‘I would personally give priority to a window cleaner with a sprained ankle sustained at work over a bank clerk with a similar injury that occurred in a football match on Saturday afternoon.’

66Bassler 1972.
67Bassler and Schaff 1975.
68Opie 1975, p. 263.
69Noakes and Opie 1976.
70The Sport for All movement originated in the 1960s from the UNESCO-affiliated International Council of Sport and Physical Education—see Anon. 1984a.
71TNA, MH166/1394, *Records relating to the Ministry of Health and Department of Health and Social Security*.
72Ibid; Letter M. J. Prophet to Dr Denis, n.d. c. 1971.
Where there was much stronger evidence for the connection between vigorous exercise and heart health was, ironically, in the rehabilitation of cardiac patients. In 1969, Dr H. E. Lewis of the National Institute of Medical Research (NIMR) in London, made a proposal to the Medical Research Council (MRC) for a long-term study of exercise therapy in heart disease, looking at the outcomes of a gym-based training regime in middle-aged men. Many within the MRC expressed anxiety about the ethical implications of having at-risk participants do vigorous exercise, but the NIMR’s ethics committee ruled that the experiments were acceptable. The Sports Council was brought in as a major funder, giving £7,500 to the MRC in 1970.

As a consequence of the ethical questions, those running the investigation were left with a sensitivity towards discussions of the possible risks of exercise. In 1975, the lead researchers of the MRC/Sports Council study found themselves in the rather awkward position of having to deny Bassler’s hypothesis, whilst simultaneously contradicting his critics. In response to one of Opie’s letters, members of the MRC’s research team responded that ‘Opie… may save an over-enthusiastic minority of people, but he is in danger of deterring the inert majority’. Significantly, the ‘safe sport’ the research team were promoting not the freely taken exercise advocated by Bassler. Instead, their regime was specifically designed, carefully controlled and individually tailored. It was a prescription. And just as with any other drug, what could cure could kill; exercise was safe and beneficial only as long as it was controlled and supervised by medical professionals.

While many of the ‘inert majority’ were unmoved by the leisure revolution, a significant minority were taking up endurance sports. We might expect this popular participation to demystify and demedicalise the ‘dangerous’ marathon. After all, the London Marathon did not experience its first death for a decade (although the first resuscitation took place in 1983). In fact, burgeoning participation apparently led to increased medical intervention and supervision. In 1984, the Sports Council and Health Education Council convened a special conference on the topic of the London Marathon; the British Journal of Sports Medicine dedicated a whole edition to coverage of the conference. Consequently, the ‘Fitness and Health Advisory Group’ of the Sports Council and the Health Education Council collaborated to produce a series of leaflets giving medical advice to would-be runners, as well as organisers of marathons and half-marathons. These were extensive leaflets, including advice on diet, clothing, weather conditions and avoiding trampling. Quite specifically, the guidelines insist that a qualified medical professional—a doctor with adequate sports experience—ought to be quickly recruited to plan any event. Not all of this advice/control was imposed from without, as there

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73 TNA, FD 23/1289. Materials Relating to the Medical Research Council.
74 Ibid; letter J. H. Humphrey to Dr H. E. Lewis, 14 May 1970.
75 Rodda 1970.
76 Carruthers et al. 1975.
77 See Plymire and Bennett 2002.
78 The rhetoric of ‘prescriptions’ was explicitly used. See Anon. 1973.
79 The Bulletin of the British Association of Sport and Medicine (f.1964) changed its name to the BJSM in 1968.
80 Anon. 1984b.
81 Anon. 1984b, p. 1355.
is evidence that runners sought out medical information. In late 1981, Capital Radio solicited the services of a prominent Olympic sports doctor, Dr Malcolm Read, to provide a series of short programmes for listeners on how to prepare for the upcoming London Marathon.82

If anything, medical controls over the marathon have increased since exercise was declared, on balance, to be beneficial to heart health. The conceptualisation of exercise as a drug is explicit; it has side-effects, and needs to be carefully monitored and controlled by an emerging sports medicine profession. Normal, healthy bodies need to engage in systematic training to adapt their bodies to the physical demands of exercise—to create (albeit temporarily) an ‘athletic body’ with which to do athletic feats; hence the regular use by sports governing bodies of the principle of ‘[g]etting fit to play sport and not playing sport to get fit’.83

**Conclusion**

Over a hundred years, the elite, dangerous marathon of the early twentieth century has become the accessible, achievable event of the twenty-first century. Likewise, the enlarged Victorian Athlete’s Heart, pathological and unhealthy, has become the fit, physiologically adapted heart. Even women, barred from the Olympic marathon until 1984, are now judged to be physically robust enough to compete. But the normalisation of both the marathon and the Athlete’s Heart has come about concurrently with an increasing medicalisation of sports and sports participation. The Athlete’s Heart is therefore a good case study for the history of sports medicine in Britain. From the late nineteenth into the early twentieth century, the athlete was a normal, healthy person; training was more about learning skills and breaking sedentary habits than about enhancing the body.84 Indeed, any enhancement or alteration was generally regarded as dangerous and pathological. The normal healthy heart could endure vigorous exercise without permanent hypertrophy; only the diseased or damaged heart showed disproportionate enlargement.

Through two world wars, and the necessary medico-scientific focus on young, fit, male bodies, the Athlete’s Heart became a reality again, as the athletic body itself was described as a unique and distinct clinical object. International competition, physiological research, and a critical mass of interested doctors and medical professionals drove the study of the athlete and his special needs and injuries; the marathon was then an event for national heroes and their specially adapted bodies. No sooner had the Athlete’s Heart been quantified than it was challenged in the second half of the twentieth century, as marathon distances were more regularly being covered by non-elite sportsmen (and, shockingly, women). The special nature of the athletic body had been a mechanism for prioritising specialist, expert knowledge in a confusing field. But how could the knowledge of this specialised body, and its specialised heart, be translated into the bodies of ‘normal’ people? To take part safely in sport one now needed to be screened and

82Personal Collection of Dr Malcolm Read. Various Materials relating to the London Marathon and Capital Radio, c. October–November 1981.
83For rugby, see Thomas 1988, p. 831. For squash, see Fowler 1984.
84Hoberman 1992, particularly chs 3 and 4; Beamish and Ritchie 2005.
advised. Ideally one ought to grow one’s own Athletic Heart—an enlarged, adapted organ carefully trained and nurtured to enable a ‘normal’ person to take part in an extraordinary event.

The Athlete’s Heart highlights some familiar tensions between public health and individual benefit—between risk and reward. As the connection between sedentary lifestyles and heart disease became part of medical orthodoxy it could be assumed that the British population would, collectively, benefit from increased activity levels. Yet many doctors continued to point out that vigorous exercise could be dangerous for some participants with (often occult) medical preconditions. Even for more minor injuries there is a payoff between long-term health gains and short-term morbidity. As one British sports doctor put it in the late 1970s, ‘sport for all’ meant sports injuries for all.85 Governments worried about public spending were extraordinarily wary about promoting sport for health when they were unwilling (or unable) to fund sports medicine services.

Some stories about risk, reward and responsibility have remained remarkably constant over the best part of a century. As early as 1867, in response to those early criticisms of the University Boat Race, fears were voiced that over-caution might harm both individuals and the nation:

It is not by so niggardly an economy of nerves that noble races acquire or preserve their vigour. Let us teach our youth by all means the value of their own health, but let us beware of quenching their emulation, lest we foster... degeneracy.86

Similarly, one hundred years later the ‘inert majority’ were constantly at risk of being put off by the wary voices of cardiologists.

The negotiation of risk and responsibility raises a final point—the intertwining of the Athlete’s Heart as a clinical feature, and the emergence and defence of a specialism in the British medical system. It is the runner’s failure to engage with, and heed the advice of, the medical profession which puts him at risk. The medicalisation of vigorous exercise, the explicit and sometimes literal use of language such as ‘exercise prescription’ was a mechanism used to protect the relatively newly established specialty area of sports medicine. Having defined its clinical expertise through the elite body of the athlete, British sports medicine was challenged by the leisure revolution. If sport was to become part of a ‘normal’ healthy life, then sports medicine could merely be reintegrated into general practice. At best, in this scenario, sports doctors could merely maintain their expertise in a tiny sub-population of elite athletes. Instead, ways were found to map athletic features on to normal bodies. The general population was told it had to train for sports, and the ‘get fit to play sport’ mentality was used to explain how the normal body could participate in the abnormal, specialist activities of sport.

Identifying out-groups is essential to self-identity and group cohesion; the practice of re-enforcing medical disciplines by condemning quackery is discussed elsewhere.87 It was a clever sleight of hand to convert exercise into medicine, as conceptualising sport as a drug was an effective way to dismiss alternative practitioners. Those who ran without

85Sperryn 1979.
86Anon. 1867.
87For a good example, see Weatherall 1996.
permission were self-medicating; those who took advice from life-style experts or non-
medically qualified sports trainers were consulting quacks. Both practices could lead
not only to long-term disease and disability, but even to sudden death. Safe sport, by
1980, was medically controlled sport.

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