XII

The Aftermath

Angina Pectoris Comes of Age

By the start of the nineteenth century, case reports of either individual or small numbers of patients with angina pectoris were becoming less common. They had ceased to be "newsworthy" as a new generation of physicians became able to recognize the characteristic features of the pain. As early as 1809 "syncope angiosa" was being described by Allan Burns as "frequent",[1] and in later nineteenth-century general medical textbooks, such as one compiled by G B Wood in the United States in 1852, there was no longer a suggestion of anything novel about angina pectoris.[2] Authors of textbooks were able to combine composite descriptions with a tally of patients in their own practices. P M Latham, writing in 1876, referred to his last 13 cases,[3] whilst in France, H Huchard had by 1889 drawn upon his experience of 78 of his own patients (excluding syphilitics)[4] and he quoted M Gauthier as having seen 172.[5] In 1901 William Osler, then practising in the United States, reported 40 cases of his own.[6] Set against the close to 100 patients with angina pectoris seen by William Heberden a century earlier,[7] the numbers seen by any one of these physicians of the Victorian era are not particularly striking. However, the total number of doctors in the western world had greatly increased since the mid-eighteenth century. There were 15,116 physicians and surgeons practising in England in 1881[8] in contrast to 363 physicians and 89 surgeons when the first comprehensive register was established in 1783.[9] Cardiology did not have any formal status as a speciality in the nineteenth century and with treatment limited to amyl nitrite and glyceryl trinitrate, which any doctor could prescribe, there were no compelling reasons for referrals to specialists in internal medicine. There are therefore grounds for presuming that the average practitioner saw as many patients with angina pectoris as did the academic physicians who compiled the textbooks. With the greater number of the

[1] Allan Burns, *Observations on some of the most frequent and important diseases of the heart*, Edinburgh, T Bryce, 1809, p. 137.

[2] G B Wood, *A treatise on the practice of medicine*, Philadelphia, Lippincott, Grambo, 1852, Part II, p. 202.

[3] P M Latham, *Collected works*, vol. 1, *Diseases of the heart*, London, New Sydenham Society, 1876, pp. 445ff.

[4] H Huchard, *Maladies du coeur et des vaisseaux*, Paris, Octave Doin, 1889, p. 400.

[5] Ibid., p. 394.

[6] William Osler, *The principles and practice of medicine*, 4th ed., Edinburgh and London, Y J Pentland, 1901, p. 761.

[7] William Heberden, *Commentaries on the history and cure of diseases*, Boston, Wells and Lilly, 1818, p. 295.

[8] W J Reader, *Professional men: the rise of the professional classes in nineteenth-century England*, London, Weidenfeld and Nicolson, 1966, p. 211.

[9] Joan Lane, 'The medical practitioners of provincial England in 1783', *Med Hist*, 1984, **28**: 353–71, p. 353.

Table XII.1
Annual mortality per million from diseases of the circulatory system and dropsy

Age	Annual mortality			
	1851–60		1861–70	
	Male	Female	Male	Female
25–34	514	603	665	631
35–44	1,002	1,118	1,233	1,191
45–54	1,898	2,664	2,187	2,176
55–64	4,130	4,588	4,581	4,762
65–74	8,714	8,916	9,229	9,431
75+	12,203	11,234	12,825	12,027

Source: *Supplement to the 45th annual report of the registrar-general of births, deaths and marriages in England and Wales*, London, Eyre and Spottiswood, 1885, p. cxv.

former it would be reasonable to conclude that angina pectoris was becoming more prevalent in England during the nineteenth century. Clinical accounts, examples of which have been given, indicate that it was also becoming more widespread in the western world and no longer exclusively "a British disease".[10] It still involved males predominantly and remained an affliction of the affluent. Samuel Black had noted in 1819 that there was "none in the poor and laborious".[11] Half a century later, G W Balfour commented that it was "not a very common disease amongst the lower classes and we very rarely have it in the infirmary".[12] This characteristic was confirmed by Osler, who reported in 1910 that, in all his years of practice, he had record of only one patient with angina pectoris in his hospital clinics. All the others were private paying patients.[13]

From 1837 onwards, vital statistics were tabulated nationally in England and Wales. They show an increase in death rates from cardiac and circulatory causes during the Victorian era. An example is given in Table XII.1 which compares the annual circulatory disease death rates per million population at ages twenty-five and upwards during two consecutive mid-century decades and shows an increase even in this short time.[14] The rise in the actual numbers in each age category is somewhat greater because from 1856 to 1866, mid-years of the two decades being compared, the population as a whole rose by about 12 per cent. A D Morgan has compiled data from the Registrar General's reports to indicate that deaths attributed to angina

[10] William Proudfit, 'Origin of concept of ischaemic heart disease', *Br Heart J*, 1983, **50**: 209–12, p. 209.

[11] Samuel Black, *Clinical and pathological reports*, Newry, Alexander Wilkinson, 1819, p. 8.

[12] G W Balfour, *Clinical lectures on diseases of the heart and aorta*, London, Churchill, 1876, Lecture xii, p. 279.

[13] William Osler, 'The Lumleian lectures on angina pectoris, Lecture I', *Lancet*, 1910, **i**: 697–702, p. 698.

[14] *Supplement to the 45th annual report of the registrar-general of births, deaths and marriages in England and Wales*, London, Eyre and Spottiswood, 1885, Table 5, p. cxv.

pectoris increased from about 250 in 1855 to 600 annually by the end of the century.[15] Unfortunately, with the exception of these suspiciously small numbers, it is impossible in nineteenth-century official statistics to distinguish coronary heart disease mortality from other cardiac or even some general causes. On occasion, deaths due to heart disease were tabulated as such. At other times they were combined with dropsy and diseases of the circulatory system in general. A preponderance of male deaths at younger ages would have been expected if coronary heart disease was then a major cause, as before the age of fifty-five it has been very largely an affliction of males. In fact the government statistics indicate that mid-century male and female death rates were almost identical at all ages.[16] It is unlikely that many deaths after, say, the age of sixty were due to rheumatic heart disease as such patients rarely survived that long. The remainder, however, would not necessarily have been CHD deaths. The then undiagnosable hypertension may have contributed to the rising total of deaths late in life and their number is unknowable. One suspects that, although indeterminate in its extent, some rise in CHD death rates did contribute to the documented overall nineteenth-century increase in all causes of cardiovascular disease mortality, and consideration of possible reasons is warranted.

Demographic changes during the century that followed the first recognition of angina pectoris exceeded the sum of all that had gone before. Between 1771 and 1871 the population of England rose threefold, from 6,623,000 to 21,501,000, all the more remarkable as emigrants vastly outnumbered immigrants.[17] Fertility may have continued to increase modestly during the early nineteenth century as the age of spinsters at marriage continued to decline slightly.[18] Mortality at all ages decreased. In particular, deaths due to infectious diseases lessened with improvements in sanitation and in the quality of the water supply, notably as a result of the reforms instigated by Edwin Chadwick.[19] As the country's inhabitants grew more numerous, they also tended to live longer. Male life expectancy at birth increased from 40.4 years in the period 1838–44 to 44.1 in the last ten years of the nineteenth century. For women the corresponding rise was from 42.0 to 47.8 years. There was even a modest increase in the expectation of life at age 45. In the period 1838–44 it was 23.1 and 24.2 years for men and women respectively. By 1870 it had risen to 27.5 and 32.7 years respectively. The absolute number of persons who lived not only to middle age but even beyond increased considerably. There were 629,000 people over 60 in England in 1801; by 1871 they numbered 1,515,000.[20]

During the Victorian era the middle classes increased in number at an even faster rate than the general population, a rise well documented by W J Reader in the case of family heads in professional occupations. These included clergymen and persons engaged in finance, the arts, medicine, law and teaching. Between 1841 and 1881,

[15] A D Morgan, 'Some forms of undiagnosed coronary disease in nineteenth-century England', *Med Hist*, 1968, **12**: 344–58, p. 356.
[16] *Supplement to the 45th annual report of the registrar-general*, op. cit., note 14 above, p. cxv.
[17] E Anthony Wrigley *et al.*, *English population history from family reconstitution 1580–1837*, Cambridge University Press, 1997, p. 614.
[18] Ibid., p. 134.
[19] Roy Porter, *The greatest benefit to mankind*, London, HarperCollins, 1997, p. 410.
[20] Wrigley, *et al.*, op. cit., note 17 above, p. 614.

for example, their numbers rose by 125,000 to 315,000,[21] while, in contrast, the general population of England and Wales grew by only 63 per cent. The total number of middle-class heads of family was even larger than indicated by these figures; to them must be added army and navy officers, large numbers of small-scale entrepreneurs engaged in manufacturing and distribution and the mechanical engineers and technicians needed to keep the growing number of factories in operation. The middle classes' rise in number was in part a reflection of the general increase in population, but they also gained recruits from the working classes. As an example, artisans employed in expanding sections of the economy were often able to set up in business on their own and eventually become employers of labour. J Seed estimated that about 20 per cent of such people eventually moved into the middle class, defined as possession of capital credentials and/or property and with emancipation from manual labour.[22] Seed drew particular attention to the small farmers and semi-independent craftsmen from among whom an emergent middle class could be traced.[23] Finally, there were aspects of middle-class life that would have resulted in mortality rates below the national average and the proportion reaching middle and later life being higher. It is doubtful if greater access to doctors and medical advances made much of a contribution to this difference, despite developments such as the introduction of general anaesthesia[24] and antiseptic surgery.[25] The middle class may, however, have benefitted the more from medical and surgical treatment at home rather than in hospital where risk of acquiring lethal infections was very high. By and large they had better housing, adequate nutrition and higher standards of personal hygiene. They usually reaped the benefits of public health improvements in the water supply and sewer systems before these became generally available.

Reliable estimates of the incomes of persons in any one middle-class occupation are hard to obtain. There was no income tax during many years of the nineteenth century and calculations of income from the revenue records for years in which it was levied probably result in underestimates. Collection was not very efficient; avoidance and evasion were widespread. Conclusions drawn from probate data are also unreliable because of the not uncommon practice of transferring money and assets to heirs prior to death of the benefactor.[26] It is noteworthy that when the Reform Act of 1832 extended the franchise to some 300,000 male members of the middle class, their status was based on the rental value of their property rather than on income.[27] Membership of the middle class did not guarantee freedom from want. There were certainly wide variations in income within all professions. Some barristers may have enjoyed a five-figure income, others were desperate for a brief. Some manufacturers numbered their employees in the hundreds, others in single digits. It

[21] Reader, op. cit., note 8 above, p. 21.

[22] J Seed, 'From "middling sort" to middle class in late eighteenth- and early nineteenth-century England', in M L Bush (ed.), *Social orders and social classes in Europe since 1500*, London, Longman, 1992, p. 115.

[23] Ibid., p. 117.

[24] Porter, op. cit., note 19 above, p. 367.

[25] Ibid., p. 371.

[26] Seed, op. cit., note 22 above, p. 123.

[27] George Macaulay Trevelyan, *History of England*, London, Longmans, Green, 1947, p. 634.

is therefore difficult to determine for any period the proportion of middle-class persons whose means enabled them to eat without having to consider the cost of food, denoted here as members of the "upper middle class". It would be reasonable, however, to assume that between the eighteenth and nineteenth centuries this more affluent group at minimum did not decline as a proportion of the middle class as a whole, but shared in its rise in numbers and expectation of life. It is likely, therefore, that the overall population growth and increase in the number of over 45s during the period under review was greatly exceeded by the rate of rise in the number of "upper middle class" persons reaching middle age and beyond. These were the people most likely to become victims of coronary heart disease.

It follows that more than in the eighteenth century, demographic changes in the nineteenth could account in large measure for any rise in the incidence of the already prevalent coronary heart disease. However, the part played by changes in lifestyle risk factors needs consideration as well. Evidence was presented earlier to suggest that of all the changes in eighteenth-century life that contributed to the emergence and subsequent increasing incidence of angina pectoris, the most important was the greater production and rising consumption of fatty animal foods. The advances in farming methods that had been introduced in eighteenth-century England were developed further in the nineteenth and adopted ever more widely. Pastures were better drained and improved by being sown with selected grasses of proven value. Manure was used intensively and guano imported as a fertilizer from about 1820 onwards. The breeding techniques introduced by Robert Bakewell continued to be applied and their potential was the more fully realized because of the continued enhancement of the nutrition of farm animals. These changes however were largely quantitative and lacked the revolutionary character of the earlier period.[28] Despite these improvements, there is little evidence of much overall increase in the number of animals farmed in England and Wales. Comparison of 1770 with 1870 estimates indicate a 14 per cent growth in the cattle population[29] and a 38 per cent increase in the number of pigs, whilst that of sheep declined by almost a quarter.[30] Reliable estimates of the poultry population are not available.

For several reasons an increase in the amount of marketable meat and fat was greater than the rise in the number of animals would suggest. Firstly, the proportion of mature animals among those available annually for slaughter rose during the intervening century. The techniques of selective breeding pioneered by Bakewell and improvements in pasturing and stall feeding resulted in early attainment of adult weight of both sheep and cattle.[31] Secondly, as oxen continued to be replaced at the plough by horses,[32] and sheep were raised less for their wool and more for their meat, the proportion of animals available for human consumption increased. Holderness

[28] B A Holderness, 'Prices, production and output', in G E Mingay (ed.), *The agrarian history of England and Wales, Volume VI: 1750–1850*, Cambridge University Press, 1989, p. 334.

[29] G E Fussell, 'The size of English cattle in the eighteenth century', *Agric Hist*, 1929, **3**: 160–81, p. 163.

[30] G E Fussell and L Goodman, 'Eighteenth century estimates of British sheep and wool production', *Agric Hist*, 1930, **4**: 131–51, p. 134.

[31] Holderness, op. cit., note 28 above, pp. 332, 338.

[32] Ibid., p. 289.

estimated that between 1750–70 and 1850 domestic meat production increased slightly over twofold in the case of mutton and lamb, beef and veal, and a little less than twofold for pork and bacon.[33] After the legislative union with Great Britain in 1800, animals from Ireland became available, and, with some supplies from the Continent, meat imports into the United Kingdom reached over one million cwt by 1870, adding perhaps 5 per cent to the domestic supply. However, even when all these factors are taken into consideration, it is probable that the increase in availability of meat and fat, considerable though it was, could scarcely keep pace with the concurrent threefold growth in the human population. The national per capita consumption of these foods must therefore have stayed about the same at best and there may even have been a decrease.

The situation with respect to London suggests that the capital fared better than the country as a whole. The number of cattle sold at Smithfield Market rose about threefold between 1750 and 1850, from 71,000 to 227,000 and the sheep from just over 650,000 to over a million and a half.[34] The number of sheep more than doubled.[35] Here too the hundred-year increase in the amount of meat and fat available to the metropolis was probably greater than the changes in the number of animals would suggest. As already noted, the animals matured earlier and the individual mature weights of cattle and sheep tended to become greater. Also, some new meat markets opened up and furnished the capital with additional supplies. However, even when these factors are taken into consideration, it is unlikely that the increase in meat and fat supply could have reached the fivefold figure that defined the population increase of London between 1750 and 1850.[36] As was the case nationally, the per capita availability of animal foods in the metropolis would have remained at best unchanged and may even have declined slightly.

The overall figures that have been cited conceal wide per capita consumption differences within the populations of both London and the country as a whole. The skilled workman and the servant class usually ate adequately. However, the labourers and their families had little animal food. Their diets may even have worsened as the descendants of subsistence farmers became urbanized, and for many their meals consisted largely of bread and potatoes washed down with sugared tea.[37] Even these standards were affected adversely at times by rising prices or economic downturns. In contrast, the "upper middle class" could readily afford animal foods and maintain its disproportionately large share of the total available nationally.

Even with this advantage, however, the per capita meat and fat available for purchase by members of the upper middle class could not have become appreciably greater during the period under consideration and indeed may have fallen slightly. The quantity of animal products marketed, although increasing during the period under review, hardly kept pace with the approximately threefold rise in upper middle

[33] Holderness, op. cit., note 28 above, pp. 154–5, 166, 170.
[34] B R Mitchell, *British historical statistics*, Cambridge University Press, 1988, p. 708.
[35] Ibid., p. 708.
[36] Roy Porter, *London: a social history*, London, Hamish Hamilton, 1994, p. 131; Mitchell, op. cit., note 34 above, p. 19.
[37] B Seebohm Rowntree, *Poverty: a study of town life*, London, Macmillan, 1901, pp. 99–100, 115.

class numbers as suggested by comparing Joseph Massie's 1759 estimate[38] with that of W J Reader for 1881.[39] Similarly, B A Holderness concluded that per capita overall consumption of dairy products declined between 1750 and 1850.[40] Any market-imposed limitations aside, moreover, it is hard to conceive how in general any one person's intake of fat rich animal foods in a single meal could have exceeded the gargantuan amounts consumed individually by the affluent during the late eighteenth century. Restraints on greater consumption were if anything imposed by limits to the capacity of the human digestive system. In contrast to that of the eighteenth, the nineteenth-century increase in incidence of angina pectoris was not therefore associated with any evident increase in per capita intake of animal fats by the susceptible part of the population. Individually its members did not obviously eat more than their predecessors, but there were many more of them and on average they were older.

Turning to changes in other risk factors with origins in an earlier century, N Deerr documented a more than fourfold rise in sugar consumption during the nineteenth century, from 18.0 lbs annually per head in its first decade to 78.9 lbs in the last.[41] More recently, B R Mitchell published estimates that were not dissimilar; an average annual consumption of 19.6 lbs per head during the years 1799–1803, rising to 81.0 for 1894–98.[42] Sugar was used liberally by all sections of the population so that an increase in middle- and upper-class consumption probably reflected the national average, and sugar could therefore have contributed in some measure to a nineteenth-century rise in the incidence of angina pectoris. Coffee consumption in England was low at the beginning of the nineteenth century, possibly as a result of trade disruptions during the Napoleonic wars. It rose subsequently from an annual mean of 0.10 lbs per head during the years 1804–8 to a peak of 1.27 for the period 1854–58, after which there was a gradual decline to an average of 0.69 lbs per person during the 1894–98 quinquennium.[43] It would seem unlikely therefore that coffee contributed to any rising prevalence of angina pectoris in England during the Victorian era. The coming of the railways was unlikely to have made much impact on the general level of physical activity in view of the transformation in travelling patterns already effected by the improved speed and efficiency of horse-drawn transport (page 141). Some hardy souls who had been in the habit of riding long distances on horseback may have lowered their exercise tolerance as they took to the new means of transport. However, for most people there was no obvious change in physical activity as they changed from the stage coach to the train.

The only completely new risk factor to emerge in Victorian England was cigar smoking which became popular among the middle and upper classes and tended to replace other ways of using tobacco. Its medical significance has been shown in a recent cohort study of 17,774 men of between thirty to eighty-five years of age at

[38] Paul Langford, *A polite and commercial people: England 1727–1783*, Oxford University Press, 1992, p. 64.
[39] Reader, op. cit., note 8 above, p. 211.
[40] Holderness, op. cit, note 28 above, pp. 166–70.
[41] N Deerr, *The history of sugar*, 2 vols, London, Chapman and Hall, 1949–50, p. 532.
[42] Mitchell, op. cit., note 34 above, pp. 709–10.
[43] Ibid, pp. 709–10.

baseline and followed until either first hospitalization or death from cardiovascular disease or, if event-free, for twenty-four years. 14,682 had never smoked cigarettes and did not currently smoke a pipe. They were either non-smokers or had smoked a pipe in the past and constituted the control group. 1,546 had smoked cigars exclusively. The multivariate analysis included corrections for the cigar smokers being on average slightly older and having greater body mass indices, higher serum cholesterol levels, increased systolic and diastolic blood pressures, and diabetes more often. When compared with the controls, there was a modestly increased incidence of CHD among the cigar smokers with a relative risk of 1.27 (CL 1.12–1.45). It was somewhat greater among the men who smoked more than five cigars daily (RR 1.56, CL 1.21–2.01).[44] As the controls included some pipe smokers, the significance of the findings is increased, suggesting cigars could have made some small contribution to any nineteenth-century increase in coronary heart disease incidence.

In conclusion, there was probably some increase in the incidence of angina pectoris during the Victorian era, a time when populations were growing rapidly and becoming older. It remained for the most part a complaint of the middle and upper classes. In England there was little change in the pattern of lifestyle risk factors first established during the previous century, but as these lifestyles spread to other countries, angina pectoris ceased to be purely a "British disease".[45]

Modern Times

The terms stable and unstable angina, myocardial infarction, sudden death and heart failure of ischaemic origin are currently used to describe the main clinical variations within the spectrum of coronary heart disease. Understanding of coronary heart disease during the 200 years following its 1768 recognition evolved with two contributions close in time laying the foundations for the modern classification of the clinical variants. In 1910 W P Obrastzow and K D Straschesko linked prolonged chest pain with myocardial infarction secondary to coronary arterial obstruction by thrombosis but compatible with short-term survival.[46] Two years later James B Herrick too delineated the distinctive clinical and pathological features of myocardial infarction, again with initial survival[47] and he subsequently established the electrocardiographic features that facilitated diagnosis in life.[48] However, the nature of coronary heart disease did not change during 200 years in anything but the absolute and relative incidence of its various manifestations. In the clinical descriptions by William Heberden[49] and contemporaries such as John Fothergill[50] it is possible

[44] C Iribarren *et al.*, 'Effect of cigar smoking on the risk of cardiovascular disease, chronic obstructive lung disease, and cancer in men', *N Engl J Med*, 1999, **340**: 1773–80, pp. 1775–6.

[45] Proudfit, op. cit., note 10 above, p. 209.

[46] W P Obrastzow and N D Straschesko, 'Zur Kenntnis der Thrombose der Koronarterien des Herzens', *Zschr Klin Med*, 1910, **71**: 116–32, pp. 118–21.

[47] James B Herrick, 'Clinical features of sudden obstruction of the coronary arteries', *JAMA*, 1912, **59**: 2015–20, pp. 2017–18.

[48] James B Herrick, 'Thrombosis of coronary arteries', *JAMA*, 1919, **72**: 387–90.

[49] William Heberden, 'Some account of a disorder of the breast', *Med Trans Coll Physns Lond*, 1772, **2:** 59–67, pp. 59–64.

[50] John Fothergill, 'Further account of the angina pectoris', *Medical Observations and Inquiries*, 1776, **5**: 252–8, p. 254.