The Hazards of Wealth: Adult Mortality in Pre-Twentieth-Century England

Summary. English historical evidence suggests that before the twentieth century, adult mortality may have been as high among the wealthy as it was among the poor. Provisional data for the eighteenth and nineteenth centuries indicate that in many areas, the aristocracy, gentry, merchants and professionals died in as great a number as labourers and poor husbandmen.
Given the known association between poverty and ill-health, this finding represents something of a conundrum. A review of literary evidence suggests that the ownership of wealth carried its own risks. Medical authorities and other writers described in detail the hazards of wealth: the excessive consumption of food, alcohol, and tobacco, linked to physical inactivity and other lifestyle factors. This paper suggests that the correlation between socio-economic status and adult mortality only emerged at the end of the nineteenth century, although this conclusion will require confirmation through further research on a systematic and nationally representative sample.

Keywords: wealth; poverty; mortality; lifestyle; alcohol; nutrition; tobacco; physical inactivity and obesity

The association between social class and adult mortality has become one of the key areas of research in twentieth-century epidemiology and demography. Recently, Wilkinson and Marmot have argued that there is a general link between social inequality and adult mortality, partly mediated through the impairment of immunity resistance resulting from 'status stress'. In support of this thesis, they have quoted references to links between poverty and high mortality in eighteenth and nineteenth century England.[1] Davey Smith and colleagues have stressed the role of lifestyle and life-course events, and have also cited historical evidence for a close association between poverty and ill-health.[2]

There is abundant historical and contemporary data to indicate that inadequate nutrition, poor housing and over-crowded environments result in increases in mortality.[3] However, much of the historical evidence for the association between poverty and adult mortality is based on flawed methodology and unreliable evidence.[4] We shall present research in this paper to suggest that before the twentieth century, male adult mortality in England may have been as high among the wealthy as it was in the general population, and in some periods and places may have been higher than it was among the poor.

There is some evidence to indicate that a social class gradient in infant and child mortality emerged in the eighteenth century. However, this was not true of adult mortality, and an association between socio-economic status and adult male mortality probably did not become fully established until the twentieth century.[5] Given the known link between poverty and mortality, this contradiction represents an historical puzzle which warrants further investigation. This paper will explore the possible reasons for this conundrum, discussing a range of evidence from contemporary sources, and linking this with current understanding of health and mortality among the adult population.

Given the provisional nature of the evidence, the central aim of the paper is not to provide definitive answers to the questions raised, but rather to stimulate a

debate about the potential hazards of wealth to health and mortality in the pre-twentieth-century period. The data we present are limited in scope, both in the size of samples and the geographical areas covered, and suffer from a lack of randomness due to the self-selected nature of much of the source material. However, the data are from a number of independent sources which suggest certain provisional conclusions, providing the basis for more systematic and comprehensive research in the future.

Socio-Economic Status and Adult Mortality before the Twentieth Century

One of the most reliable studies of socio-economic status and mortality before the twentieth century is that by Hollingsworth on the aristocracy. It is possible to compare his findings with those for England and Wales, in the middle of the nineteenth century, after the introduction of civil registration.

Table 1: *Expectation of Life at aged 20 amongst the Aristocracy and the Population of England and Wales (Years)*

Cohort Born	*Males*	*Females*
Aristocracy , 1825-49	42.0	48.3
England and Wales, 1840-1	39.2	41.7
Aristocracy , 1850-74	42.9	52.1
England and Wales, 1860-1	42.7	45.7

Source: Hollingsworth 1972, pp. 54, 58

Among men, the aristocracy had a slight advantage in life expectancy at age 20 in the first cohort, but this had disappeared by the later period, whereas female aristocrats had higher adult life expectancy in both periods.

These findings make no allowance for place and the role of disease environment in shaping mortality levels.[6] This can be illustrated through research published by the Victorian actuaries Bailey and Day in 1863. They compared the life expectancy of the peerage with that in the general population of England, as well as those living in healthy districts.

Table 2: *Mean Duration of Life amongst Males, Mid-Nineteenth Century*

Age	*Peerage Families*	*English Table Dr Farr*	*Healthy Districts Dr Farr*
20	41.46	39.99	43.40
30	35.51	33.21	36.45
40	28.33	26.46	29.29
50	21.40	19.87	22.03
60	14.56	13.60	15.06
70	8.77	8.55	9.37

Source: Hutcheson Bailey and Day 1863, p. 69

Life expectancy was slightly higher at all ages among the peerage than in the English population, although it was less than in those living in healthy districts. The aristocracy spent long periods living in London, in other towns and rural areas, all with different mortality risks. It is therefore important to present data, wherever possible, within geographical regions and districts, and to attempt to control for the role of place in shaping mortality levels.

The major problem with evidence on adult mortality before the advent of civil registration is the reliability of source material. Creating data through family reconstitution suffers from the problem of high migration, with only about ten per cent of reconstitution populations remaining in observation from birth to death.[7] There is also the difficulty of the unknown reliability of parish burial registers, and the problem of a variation in the reliability of data by socio-economic status. Research on the registration of child deaths using the same-name technique suggests that burial registers may have been more accurate in recording the deaths of the rich than of the poor.[8] However, there is no reliable evidence on the accuracy of adult burial registration by socio-economic status.

One way of addressing this problem is by analysing sources which give information on the mortality status of parents. Marriage licences and apprenticeship indentures were legally required to include information on consent of parents, in some cases by written affidavit, and where a father had died, this was usually indicated in the licence or indenture. However, the problem of self-selection means that these sources are not necessarily representative of the general population, although they do provide valuable evidence when viewed with other independent data. Marriage licences for East Kent yield data on occupation and paternal mortality for 289 parishes in the period 1619-1809. Table 3 gives the percentages of dead fathers of under-age daughters by occupational group.

Table 3: *Proportion of Deceased Fathers of Spinsters under 21 by Occupation of Husband in East Kent, 1619-1809 (Numbers in Cohort in Brackets)*

Period	*Occupation*				
	Gentlemen, Merchants and Professional	*Yeoman and Farmers*	*Traders and Artisans*	*Husbandmen*	*Mariners and Fishermen*
1619-1646	39% (205)	41% (274)	46% (491)	50% (213)	42% (144)
1661-1700	38% (131)	42% (169)	49% (326)	39% (122)	45% (103)
1751-1809	28% (159)	15% (207)	26% (397)	19% (108)	24% (158)

Source: Razzell 1994, p. 197

Table 3 indicates that adult mortality was slightly lower among gentlemen, merchants and professionals than in other occupational groups in the first two periods, but higher in the second half of the eighteenth century. The latter finding is confirmed by a study of marriage licences in Nottinghamshire and Sussex.

Table 4: *Proportion of Fathers of Spinsters and Bachelors under 21 Dead in Nottinghamshire and Sussex, 1754-1800*

Occupational Group	*Total Number of Cases*	*Number of Fathers Dead*	*Percentage of Fathers Dead*
Labourers and Servants	225	36	16%
Husbandmen	180	34	19%
Artisans and Tradesmen	582	123	21%
Farmers and Yeomen	457	76	17%
Gentlemen and Professionals	92	32	35%

For the source of data, see Blagg 1946-7; Shaw 1987; Macleod 1926 and 1929; Penfold 1917 and 1919

Although the sample sizes are small, the pattern is similar to that revealed in Table 3, but with a higher proportion of gentlemen and professional fathers dead. The higher mortality amongst the wealthy may have been partly a function of greater ages of fathers, but the limited amount of evidence does not support this conclusion. In the absence of birth control, the average age of fathers was probably largely shaped by age of marriage, and data from Nottinghamshire suggest that this did not vary greatly between different socio-economic groups in the first half of the eighteenth century. By the late nineteenth century, men from wealthier socio-economic groups married significantly later than those from the poorer social classes, but when this pattern first emerged is unknown.[9]

Table 5: *Median Age of Marriage of Grooms Listed in Nottinghamshire Marriage Licences, 1701-1753 (Number of Cases in Brackets)*

Period	*Gentlemen*	*Yeoman Farmers*	*Artisans and Tradesmen*	*Husbandmen*	*Labourers*
1701-20	26 (168)	26 (141)	25 (57)	27 (487)	26 (138)
1721-40	28 (118)	27 (186)	25 (133)	26 (695)	27 (89)
1741-53	25 (55)	25 (412)	24 (119)	26 (254)	25 (85)

Source: Chambers 1965, p. 332

There is additional evidence available on paternal mortality by socio-economic status during the early eighteenth-century period. Apprenticeship indentures include information on amount of premium paid and the occupation of fathers, and there was a strong association between occupation and premium level, with gentlemen, merchants and professionals paying the highest premiums, and labourers and servants paying the lowest ones.[10]

Table 6: *Mortality amongst Fathers listed in the British Apprenticeship Register 1710-13 by Amount of Premium Paid*

Premium Paid	*Number of Cases*	*Percentage of Fathers Dead*
£1-£5	541	23%
£6-£19	587	30%
£20+	532	34%

Source: Razzell and Spence 2004, p. 63

Table 6 indicates a positive correlation between wealth and adult mortality among apprentices' fathers. The association between wealth and mortality might be partly explained by the wealthy living more frequently in London and other unhealthy towns and cities, but as Table 7 indicates, even in an unhealthy area like London, there was a link between wealth and mortality.[11]

Table 7: *Mortality amongst London Fathers listed in the British Apprenticeship Register 1710-13 by Amount of Premium Paid.*

Premium Paid	*Number of Cases*	*Percentage of Fathers Dead*
£9 And Under	110	32%
£10-£19	93	41%
£20+	99	42%

Source: Razzell and Spence 2004, p. 54

Although the number of cases is small, there is still the same gradient between wealth and mortality in London as found nationally.

All the above evidence from marriage licences and apprenticeship indentures is subject to a measure of uncertainty because of the lack of exact information on the ages of fathers and the self-selected nature of the samples. More reliable data become available with the introduction of national censuses and civil registration in the nineteenth century. However, because of the way the data have been processed and interpreted, it is often itself of uncertain reliability. For example, Chadwick and others produced data to show that the wealthy lived longer than the poor, but this material was generated through a faulty methodology, using age at death as a measure of life expectancy, and not allowing for differences in the age structure of the population at risk.[12]

Farr produced evidence on the different registration districts of London, including information on their socio-economic characteristics and associated mortality levels.[13] He classified the mean rateable value of each district and published initial findings on two of the districts, which showed some association between wealth and mortality. He did not pursue this analysis but subsequently provided raw data for all districts which are analysed in Table 8.

Table 8: *Adult (25-44) Mortality in London, 1838-44*

Registration Districts	*Mean Annual Value of Rated Property on Each House*	*Adult (25-44) Male Mortality Per 1000*
10 Districts with Lowest Mean Rateable Value	£15	13
10 Districts with Medium Mean Rateable Value	£26	15
10 Districts with Highest Mean Rateable Value	£58	13

Source: Razzell 2006

The districts with the lowest rateable values were mostly in the East End and the wealthiest in the West End of London. Table 8 indicates that there was no significant association between the wealth of a district and its adult mortality level.

It is possible to construct reliable statistics of adult mortality for the period after 1841 in individual rural and urban parishes by using censuses and information in burial registers. This involves tracking married couples in the censuses of 1841 and 1851, and linking this data with that in the parish burial registers for the intervening years. This methodology has the advantage of triangulation, allowing the comparison of information about widows and widowers in the census of 1851 with that in the burial registers. The selection of married couples allows the measurement of independent demographic events for establishing the period at risk – the listing of a spouse in a burial register, the baptism of a child, or the enumeration of the husband or wife in a later census.

To evaluate the impact of socio-economic status on adult mortality, a sample was constructed for 47 Bedfordshire parishes,[1] selecting the first married couple with elite status in the census of 1841. All professional, merchant and independent families with at least one domestic servant were selected for the elite category – there was an average of 3.2 servants per family – and they were matched with the next labourer's family of a similar age in the census schedule. The age of labourers selected was within plus or minus five years of that of elite husbands.

Table 9: *Mortality amongst Husbands and Wives Enumerated In Bedfordshire Censuses, 1841-1851*

	Number of Grooms and Brides	*Number of Traced Cases*	*Number of Traced Cases Dead*	*Percentage of Traced Cases Dead*	*Number of Years at Risk*	*Average Age of Traced Cases (Years)*
Professional, Merchants and Gentlemen	250	165	26	16%	1531	39.8
Labourers	250	182	27	15%	1738	40.7

A total of 250 married couples were included in the sample – 125 from elite families and 125 from labourers' families. Of the 250 husbands and wives in the elite category, 165 were traced (66 per cent) either in the census of 1851 or the burial register; the equivalent figure for the labourers' sample was 182 out of 250 (73 per cent). Most of the untraced cases were probably due to migration, as they involved the disappearance of both husband and wife. It is unlikely that burials of both husband and wife were not registered, given the high quality of the burial registers in these rural parishes at this

[1] The parishes were chosen in sequence from the Registrar-General's list of censuses of 1841 and were as follows: Ampthill, Arsley, Aspley Guise, Bedford St Cuthbert's, Bedford St John's, Bedford St Mary's, Bedford St Paul's, Biggleswade, Blunham, Clifton, Clophill, Colmsworth, Cranfield, Dunstable, Eaton Socon, Flitton, Harrold, Haynes, Henlow, Higham Gobion, Holwell, Houghton Conquest, Houghton Regis, Hunwick, Kempston, Keysoe, Langford, Leighton Buzzard, Lower Gravenhurst, Luton, Melchbourne, Northill, Pertenhall, Poddington, Potton, Turvey, Renhold, Shefford, Shelton, Southill, Stotfold, Streathley, Tilbrook, Tingrith, Toddington, Turvey, Woburn, and Wrestingworth.

time. Of 32 widows and widowers identified in the census of 1851, 30 of their spouses were located in Anglican burial registers between 1841 and 1851, indicating a high degree of burial registration reliability.

Twenty-six of 165 elite husbands and wives (16 per cent) died in the decade between 1841 and 1851, whereas the number amongst the 182 labourers' husbands and wives was 27 (15 per cent). This slightly higher mortality among elite families was in spite of a lower average age of husbands in 1841, and a shorter period at risk. Among wives, mortality was also higher in elite than in labourers' families: 13 out of 79 traced cases died (17 per cent) as against 10 out of 83 (12 per cent). However, the sample sizes are small, and Table 9 suggests no significant difference in overall adult mortality between elite and labourers' families in Bedfordshire at this time.

Reliable figures for a wider range of occupations were published by the Registrar-General at the end of the nineteenth century. There was little or no correlation between social group and adult mortality in 1860-61 and 1871, although the white-collar group had the lowest adult expectation of life in this period.[14]

Research carried out by the lead author and associates on civil registers of deaths linked to censuses for Ipswich in the period 1871-1910 indicates that there was little or no difference in adult mortality by socio-economic status in the period 1871-81, but that a social class gradient began to emerge at the end of the nineteenth century. Adult mortality was measured by tracking families in the two decades 1871-81 and 1891-1901, analysing the mortality of husbands and wives where at least one of them survived to be enumerated at the end of the decade. Elite families employing a domestic servant were compared to labourers' families, with a total of 500 husbands and wives being selected in sequence from the census at the beginning of the decade.

Table 10: *Percentage Mortality among Ipswich Elite and Labourer Husbands and Wives, in 1871-81 and 1891-1901 (Number of Cases in Brackets)*

Period	*Elite Husbands and Wives*		*Labourer Husband and Wives*	
	Age Group	*Mortality Rate Percentage*	*Age Group*	*Mortality Rate Percentage*
1871-81	20-44	6.4% (299)	20-44	7.9% (303)
	45-69	17.5% (194)	45-69	16.9% (183)
1891-1900	20-44	6.0% (285)	20-44	8.4% (356)
	45-69	11.8% (169)	45-69	17.7% (175)

Source: Razzell 2006a

There was little or no gradient in the 1870s but by the 1890s differences in mortality – particularly for the age group 45-69 – were beginning to emerge. In order to establish the validity of this finding, it will be necessary to analyse much larger samples from the Ipswich study, and to carry out a random study of individual families in England and Wales.[15]

The aggregative statistics for England and Wales indicate that since the beginning of the twentieth century, a social class gradient in adult mortality has been progressively established, and the socio-economic adult mortality differential has widened significantly during the last few decades.[16]

The Role of Nutrition and Physical Activity

Given that elite families were much wealthier than other members of the population, and that they had access to much better provision of food, good housing and medical care, why were their adult mortality rates the same or even higher than the rest of the population? The issue becomes even more puzzling in the light of the relatively low adult mortality among labourers and other poor groups. There is much evidence of the inadequate diet of labourers' families in the late eighteenth and early nineteenth centuries, culminating in the 'hungry forties'.[17] Chadwick and others described the insanitary quality of much of their housing, and the poverty of labourers – particularly in rural areas – has been very widely documented.[18] Recently, Bernard Harris has argued that nutrition did play a significant historical role in shaping mortality.[19] There is good evidence that extreme poverty did significantly increase mortality in certain historical periods.[20] These findings increase the puzzle of a lack of a socio-economic gradient in adult mortality before the twentieth century.

However, there is a contemporary literature on wealth and health, which stresses the hazards of wealth rather than poverty. Thomas Tryon in 1683 wrote:

> Great drinking of *Wine* and *strong Drinks* after full Meals of *Flesh* and *Fish* … do often wound the Health … which many of the richest sort of People in this Nation might know by woeful Experience, especially in London, who do yearly spend many Hundreds, (I think I may say Thousands) of Pounds on their *Ungodly Paunches* … for their *Bellies* are swollen up to their *Chins* … their *Brains* are sunk in their *Bellies; Injection* and *Ejection* is the business of their Life, and all their precious hours are spent between the *Platter* and the *Glass*, and the *Close-stool* and *Piss-pot*.[21]

Tryon stressed that it was not just eating and drinking that was responsible for obesity, but also physical inactivity, which varied not just between individuals but among different socio-economic groups:

> Suppose a man were to seek *Fat Men* and *Women,* would he go into *Country-Villages* and *poor small Towns* among *Plough-men* and *Shepherds*? … No, no, such a Man's Errand would lie in *great Cities* and *Market-Towns,* where there is store of *strong Liquors* and *Idleness*. … [among] People that live sedentary Lives, and are easie Imployment, more especially of mature Age, as *Gentlemen* and *Citizens*, etc, who use themselves to lie long in Bed in the Morning, and to great Dinners and rich Cordial Drinks.[22]

Tryon was mainly concerned with the effect of lifestyle on the health of the wealthy, and had little to say about the ordinary population. The Puritan clergyman Richard Baxter did give a detailed account of the lives of the rural poor at the end of the seventeenth century:

> For by the advantage of their labour and health, their browne bread and milk and butter and cheese and cabbages and turnips and parsnips and carrots and onions and potatoes and whey and buttermilk and pease pies and apple pies and puddings and pancakes and gruel and flummery and furmety, yea dry bread, and small drinke, do afford their appetites a pleasanter relish and their bodyes more strength and longer life than all the varieties and fullness of flesh and wines and strong drinkes do, to the idle gluttonous and voluptuous rich men.…The worst of the poore mans case as to health, is that they are put to goe through raine and wett, through thick and thin, through heat and cold and oft want that which nature needeth.[23]

Baxter understood that the poor were able to enjoy relatively good health as long as they had an adequate diet of fresh vegetables, fruit, dairy and grain products, and engaged in vigorous activity through their working life. He may have exaggerated the quality of the diet of the poor, although he acknowledged that they suffered from the ill-effects of wet and cold.

An understanding of the link between diet, drink, exercise and health had become very general by the early eighteenth century. George Cheyne established his medical reputation through the publication in 1724 of his *Essay on Health and Long Life*, which ran to nine editions, and was translated into a number of different European languages. Cheyne summarised the main argument of this work by quoting Sir Charles Scarborough's advice to the Duchess of Portsmouth: "you must eat less, or use more exercise, or take physic, or be sick".[24]

Cheyne himself had suffered from obesity which he described in his autobiography:

> Upon my coming to London, I all of a sudden changed my whole Manner of Living; I found the Bottle Companions, the younger Gentry, and Free-Livers' to be the most easy of Access. I soon became caressed by them and grew daily in bulk and friendship with these gay gentlemen … and thus constantly dining and supping … my health was in a few years brought into great distress, by so sudden and violent a change. I grew excessively fat, short-breathed, lethargic and listless … My appetite being insatiable I sucked up and retained the juices and chyle of my food like a sponge and thereby suddenly grew plump, fat, and hale to a wonder, but … every dinner necessarily became a surfeit and a debauch, and in ten or twelve years I swelled to such an enormous size that upon my last weighing I exceeded 32 stone.[25]

Although Cheyne acknowledged that his obesity was partly a family characteristic, he understood that it was also a function of his lifestyle. The pattern of consumption of food and drink by the fashionable was partly the result of economic prosperity and the importation of luxuries:

> Since our wealth has increased and our navigation has been extended we have ransacked all the parts of the globe to bring together its whole stock of materials for riot, luxury, and to provoke excess. The tables of the rich and great (and indeed those who can afford it) are furnish'd with provisions of delicacy, number, and plenty, sufficient to provoke, and even gorge, the most large and voluptuous appetite.[26]

Cheyne summarised his general conclusions as follows:

> If any man has eat or drank so much, as render him unfit for the duties and studies of his profession … he has overdone … It is amazing to think how men of voluptuousness, laziness, and poor constitutions, should imagine themselves able to carry off loads of high-seasoned foods, and inflammatory liquors, without injury or pain; when men of mechanic employments, and robust constitutions, are scarcely able to live healthy and in vigour to any great age, on a simple, low, and almost vegetable diet.[27]

Three years after Cheyne published this work, Short wrote his *Dictionary Concerning the Causes and Effects of Corpulency*, in which he concluded that "lean People generally enjoy a far greater Measure of Health" than those who were over-weight.[28]

This theme of the damaging effects of excess and obesity became commonplace in eighteenth and nineteenth century medical writings.

One of the most popular eighteenth-century books on medicine was Buchan's *Domestic Medicine* which was first published in 1769, and was frequently reprinted in new editions through to the middle of the nineteenth century. Buchan summarised his view on activity, exercise and health as follows:

> Those whom labour obliges to labour for daily bread, are not only the most healthy, but generally the most happy … Tis now below any one to walk who can afford to be carried. How ridiculous would it seem to a person unacquainted with modern luxury … to see a fat carcase, over-run with diseases occasioned by inactivity, dragged through the streets by half a dozen horses.[29]

The ill-health of the wealthy was sometimes linked to the incidence of gout, although contemporaries had a broader conception of the disease than would be the case today.[30] The awareness of the ill-effects of over-eating does not appear to have greatly influenced the behaviour of the wealthy in the eighteenth century. Parson Woodforde detailed in his diary his dietary excesses almost on a daily basis. For example, on the 14 February 1791, he wrote, "we had for Dinner Cod and Oyster Sauce, a fillet of Veal rosted, boiled Tongue, stewed Beef, Peas Soup and Mutton Stakes. 2nd Course, a rost Chicken, Cheesecakes, Jelly-Custards &.".[31]

Evidence of this sort is of course only anecdotal, and may not be typical of the gentry's and aristocracy's consumption of food at this time. However, there are general accounts that suggest that their food consumption may have been excessive. When La Rochefoucald visited England in 1784, he described the dining customs of country houses as follows:

> Dinner is one of the most wearisome of English experiences, lasting, as it does, for four or five hours. The first two are spent in eating and you are compelled to exercise your stomach to the full order to please your host. He asks you the whole time whether you like the food and presses you to eat more, with the result that, out of pure politeness, I do nothing but eat from the time that I sit down until the time when I get up from the table.… All the dishes consist of various meats either boiled or roasted and of joints weighing about twenty or thirty pounds.[32]

Fogel has estimated that the wealthiest tenth of the population consumed more than 4000 calories per adult per day at the end of the eighteenth century.[33] This is similar to Seebohm Rowntree's finding of 4,039 calories amongst the servant-keeping class in York at the end of the nineteenth century.[34] Commenting on the findings of a survey of the budgets of six of these families, Seebohm Rowntree concluded that:

> considering these six diets as a whole, it is clear that the amount of food consumed is in excess of requirements … it is doubtful whether the work done by the six families here considered is more than 'light industrial work', the food requirements … [for which are] 3000 calories of fuel energy.[35]

Seebohm Rowntree's sample was very small and there is little direct evidence of the effect of diet on obesity levels among the rich at this time. Information was collected on the weight of the wealthy and fashionable when they were weighed at Berry's wine merchants in St James's Street, London, and weight registers have survived from 1756 to the present day. This, of course, is a self-selected sample, and the

consumption of wine is likely to have increased the incidence of obesity amongst this wealthy group. Nevertheless, the information in the registers provides some useful background data, and was used by Francis Galton in his biometric research. He analysed the weights of 139 members of the aristocracy born between 1740 and 1829, and aged 27 to 70.[36] Many aristocrats had their weights taken several times a year, and Galton compiled charts of weight by age for each individual.

He divided his sample into three birth cohorts − 1740-69, 1770-99 and 1800-29 − and found that weight fluctuated much more significantly in the first cohort, concluding that "there can be no doubt that the dissolute life led by the upper classes about the beginning of [the nineteenth century] … has left its mark on their age-weight traces".[37] Although sample sizes were small, Pearson calculated mean weights for the different cohorts, and the overall average declined from 179 pounds for those born in 1740-69 to 171 pounds for those born in 1800-29.[38] The mean average of all the weights taken for the whole sample of 139 individuals is 174 pounds – 12 stone 6 pounds.

There is no information on the heights of the peerage, but there are some data on German aristocratic students aged 21 for the period 1772-96. Sixty young aristocrats had a mean average height of 168.8 cm, 6 to 7 cm less than today's equivalent.[39] Galton quoted figures of weight by age for professional men in the early 1880s, ranging from 161 pounds for 27 year-olds to 174 pounds for 60 year-olds. No heights were recorded, but there are such data on Sandhurst recruits – perhaps representative of the professional group – which indicate an average height of 68 inches for men over the age of 21 born during the middle of the nineteenth century.[40] This can be compared to data on the weight and height of contemporary working-class populations. For example, Liverpool convicts weighed an average of 143 pounds with a mean height of 66 inches during the mid-nineteenth century. [41] This indicated that working-class men were significantly leaner than their wealthy aristocratic and professional contemporaries.[42]

The association between wealth, dietary excesses, lack of exercise and ill-health continued to be documented into the nineteenth century.[43] The influence of these factors on longevity was summarised by Sinclair in 1833:

> It has been justly observed, that it is not the rich and great, nor those that depend on medicine, who attain old age, but such as use much exercise, breathe pure air, and where is food is plain and moderate.… Hence it would appear, that the situation of the middle, and even the lower classes of society, is particularly favourable to longevity.[44]

Sinclair somewhat romanticised the condition of the poor, and perhaps a more realistic account is the following description of the life of agricultural labourers at the end of the nineteenth century:

> … wages are for labourers 8s. or 9.s. a week.… In wet weather or in sickness his wages entirely cease so that he seldom makes a full week. The cottages, as a rule, are not fit to house pigs in. The labourer breakfasts on tea-kettle broth, hot water poured on bread and flavoured with onions; dines on bread and hard cheese at 2d. a pound, with cider very washy and sour, and sups on potatoes or cabbage greased with a tiny bit of fat bacon. He seldom more than sees or smells butcher's meat. He is long lived, but in the prime of life 'crippled up', i.e. disabled by rheumatism, the result of wet clothes with no fire to dry them by for the next morning, poor living and sour cider.[45]

Other descriptions of labourers' lifestyles suggest a more generous diet, although most accounts indicate that food was often in short supply.[46] Heath noted at the end of the nineteenth century the difference in stature between the farmer and agricultural labourer: "Compare the shapely forms of the young farmers with those of the stunted young labourer, and … compare the stalwart, jovial forms of the elderly farmers with the rheumatic, misshapen forms of the old labourers, and the evil result, not only of over-early work, but of a lifetime of poor and insufficient food and bad lodging, will be manifest."[47] It may be that poor diet and poverty had a stronger impact on morbidity than mortality among labourers, although as we will now see, other factors may have influenced mortality levels.

The Role of Alcohol and Tobacco Consumption

Thomas Tryon summarised the changes that had taken place in the smoking of tobacco during the seventeenth century:

> It is not above sixty or seventy years ago since that only *Gentlemen*, and but a few of those took *Tobacco,* and then so moderately, that one Pipe would serve four or five, for they handed it from one to another … but now every Plow-man has his Pipe to himself.[48]

However, he acknowledged that among ordinary working families "the Expenses which this smoking generally draws with it, have half starved their poor Families".[49] He indicated that wealth played a role in the consumption of tobacco and other luxuries:

> Are not those that live in the most Remote parts of *England,* and far from *Cities* and *Sea-Ports*, where *Money* is scarce, and such things dear, that the common People cannot buy them, most healthful and freest from Diseases? But now these *Out-landish Ingredients* begin to be so much admired, that the *good Dame, viz the Farmers Wife* will sell her *Eggs, Butter, Cheese* and *Wheat* to buy *Sugar, Spice* and *Tobacco*.[50]

More than 60 years later, Hogarth made a similar distinction between the destructive gin-drinking of Londoners and the more healthy habits of the rural poor:

> ... go into some Country Village, where that Fiery Dragon Gin has not yet spread her Poison, and you will find their Children, though in Rags, yet of a goodly and healthful Look. Their Diet indeed is coarse, but yet it's wholesome; their Drink, though better than small Beer, answers the Ends of Nutrition better than the finest Spirituous Liquors in the World.[51]

He also drew a distinction between the habits of the wealthy and the poor in the countryside:

> The Squire, who does not keep his Cellar full of the best Liquor, is but little regarded by the Farmers and Neighbours; and if the Farmer has not a Tub of the best ready breach'd, or Brandy and other Ingredients for Punch when the 'Squire is pleas'd to honour him with his own and his Friends Company, he must never expect to be invited to the noble Sport of Hunting.… And all of them are unanimously of Opinion in one Thing, that is, that they never think they make a Friend welcome unless they make him drunk.[52]

La Rochefoucald, in his account of life in English country houses, commented on the amount of alcohol consumed during dinner:

> After the sweets … the table is covered with all sorts of wine, for even gentlemen of modest means always keep a large stock of good wine. On the middle of the table there is a small quantity of fruit, a few biscuits (to stimulate thirst) and some butter, for many English people take it at dessert … One proceeds to drink − sometimes in an alarming measure. Everyone has to drink in his turn, for the bottles make a continuous circuit of the table and the host takes note that everyone is drinking in his turn.[53]

The dangers of alcohol were well known to eighteenth-century writers and artists. One of the most vivid of Rowlandson's satires was 'Death in the Bowl', showing the skeletal figure of Death drinking with a group of obese-looking gentlemen crouched over a bowl of alcohol.[54] Another of his satires showed Death wheeling an obese man away in a wheel-barrow from a tavern, outside of which two portly gentlemen and a farmer are depicted drinking and smoking tobacco, with Death telling the dead man's wife, "Drunk and alive, the man was thine, But dead & drunk, why – he is mine."[55]

There is very little systematic evidence on the consumption of alcohol by different socio-economic groups, but the cost of alcohol probably constrained the amount consumed by the poor. The budgets published by Eden, Davies and others during the eighteenth and nineteenth centuries, showed that the labouring poor bought little alcohol.[56] However, the budgets did not reveal the full story, partly because they took no account of home brewing, but also because they did not adequately measure expenditure on alcohol at taverns and public houses. Eden attempted to summarise the overall position in 1797 as follows:

> Purchased liquor is an article of expenditure particularly prevalent in the South… [although] if taxed, at any time, with drinking too much, he [the labourer] thinks it sufficient … to allege, that, excepting on a Saturday evening, or occasions of festivity, he rarely allows himself more than a pint, or at most, a pot of beer a day.… This is not the case in the North; where, besides the pure limpid stream, the general drink of the labouring classes is either whey or milk, or rather milk and water; or, at best, very meagre small beer.[57]

A hundred years later, Richard Heath came to similar conclusions. He noted the prevalence of taverns and beer-shops in rural areas, but writing about the Weald of Sussex concluded:

> … it would be a good thing if … the little beer shops would be shut up, and a vast amount of misery prevented. Not that the peasant of the Weald is a drunkard. He is far too poor for that. It is only on club days, and occasionally on Saturday night, that he gives way. Habitual drinking in the country is the vice of a class in a superior social position.[58]

Seebohm Rowntree, at the end of the nineteenth century, also found a relatively small consumption of alcohol amongst the respectable poor: "the families studied [earning under 26 shillings a week] represent the steady, respectable section of the labouring classes, who spend practically nothing upon drink".[59] However, he echoed Heath when he concluded:

> There is more drinking in Class B [the second poorest group] than in Class A [the poorest group], but this does not imply a lower moral standard. People in Class A are for the most part so absolutely destitute that they could not get much drink even if they wished. And in Class B, as we have seen … the money for drink can only be found, in the great majority of cases, by foregoing some other expenditure which is necessary for maintaining the family in a state of physical efficiency.[60]

More prosperous working-class groups did, however, consume alcohol, and Seebohm Rowntree estimated that the average expenditure on drink was six shillings a week, absorbing 'more than one-sixth of the average total family income of the working classes of York'.[61] There is plenty of evidence that alcohol was consumed in large quantities in the second half of the nineteenth century. Samuel Smiles estimated in 1875 that the working classes spent £60,000,000 on drink and tobacco.[62] As John Burnett has pointed out, "when allowance is made for the growing number of teetotallers, it means that many families must have spent a third, and some half or more, of all their income on drink".[63] A degree of prosperity was required for the consumption of drink, and growing real incomes of working-class families after the middle of the nineteenth century made this possible.

This was also true of tobacco consumption which increased significantly after the middle of the nineteenth century, and appears to have been influenced by changes in per capita income during the period 1791-1938.[64] Budgets compiled by Eden, Davies, Seebohm Rowntree and others showed virtually no consumption of tobacco in respectable working-class families, similar to the pattern of alcohol consumption.[65] Tobacco cost about three pence an ounce, and where family incomes were less than ten shillings a week, it would have been impossible for the working poor to sustain a significant consumption of tobacco over extended periods. [66]

The literary evidence indicates that wealthy men smoked tobacco fairly regularly. Smoking rooms were introduced into some country houses as early as the 1720s, and by the middle of the nineteenth century "smoking rooms had become an integral part of most gentlemen's country houses, and guests who did not appear in them for a convivial smoke or game after the ladies had retired were liable to be dragged out of bed to conform to a recognised social convention".[67] The habits of the royal family are illuminating in this respect:

> [Queen Victoria] disliked the habit intensely … Even Prince Albert had not presumed to smoke in her presence; and at Osborne House … a special smoking room was built … The queen could always detect the smell of tobacco on documents which were sent up to her; and her Assistant Private Secrertary, Frederick Ponsoby … and his colleagues took to carrying peppermints in their pockets in case a summons to the queen came at a moment when their breath was sure to offend her.[68]

The economic capacity to consume tobacco – along with an excessive consumption of food and alcohol – undoubtedly damaged the health of the wealthy. These patterns of consumption along with a lack of physical activity may have been largely responsible for the high adult mortality of the rich, a theme which can be further explored through the work of the eminent Victorian actuary, Frederick Neison.

The Work of Francis Neison

Neison was an actuary who worked for one of the leading insurance companies, and had a life-long interest in the causes of ill-health and mortality. He was sceptical about the emphasis on sanitation and poverty by his contemporaries Farr and Chadwick, and produced a range of evidence to show the importance of personal behaviour, in particular the role of physical activity and the consumption of alcohol.[69] His starting point was evidence on socio-economic status and adult mortality:

> In the year 1843, a report was made, by a committee of actuaries, on the mortality among persons assured by seventeen of the principal assurance companies of this country, and

> these persons may be fairly considered to belong to the middle and upper classes of society; and at various periods since the year 1824, inquiries have been made into the mortality rate among the members of friendly societies, including the more industrious and prudential of the working and the labouring portion of the people. One important result derived from these investigations is, that … [the] information clearly proves the mortality of the middle and upper classes to be above, and that of the industrious working classes to be below, the ratio for the country generally.[70]

In attempting to explain this unexpected finding, Neison pointed out the importance of the characteristics of members of friendly societies:

> Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets.… For an individual to remain a Member of a Friendly Society, it is required that he should make his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes on a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident, who are more openly exposed to the vicissitudes − poverty, distress, destitution and disease.[71]

Neison recognised that poverty did play a role in creating ill-health, but argued that this was largely a function of variations in individual behaviour. He also contrasted the frugality and temperate habits of friendly society members with that of the wealthy:

> … by tracing the various classes of society in which there exists sufficient means of subsistence, beginning with the most humble, and passing on to the middle and upper classes, that a gradual deterioration in the duration of life takes place … this condition would seem to flow directly from the luxurious and pampered style of living among the wealthier classes, whose artificial habits interfere with the nature and degree of those physical exercises which, in a simpler class of society, are accompanied with a long life.[72]

He provided statistical evidence in support of the thesis that physical activity and alcohol were the key factors in shaping adult mortality patterns. He analysed friendly society records and showed that clerks whose occupation required minimal physical exertion had a significantly lower expectation of life at all ages than plumbers, painters, bakers and miners. Clerks at age 20 had an expectation of life of 31.8 years, plumbers and painters 36.9 years, bakers 40.0 years, and miners 40.7 years.[73]

Neison classified occupations by amount of physical activity, and whether they were employed outdoors or indoors, and summarised his findings as follows:

Table 11: *Expectation of Life (Years) among Friendly Society Members*

Age	*Indoor Occupations with Little Exercise*	*Indoor Occupations with Great Exercise*	*Outdoor Occupations with Little Exercise*	*Outdoor Occupations with Great Exercise*
20	41.9	42.0	37.8	43.4
30	35.1	34.5	30.1	36.6
40	27.9	27.8	23.0	29.1
50	20.5	21.2	17.3	22.0
60	14.0	15.1	11.0	15.6
70	8.6	10.4	4.6	9.3

Source: Neison 1864, p. 456

The unhealthiest occupations were those carried out outdoors with little exercise, followed by indoor occupations with little or great exercise. The healthiest occupations were those involving great exercise but carried out outdoors. Table 11 suggests that working outside did carry some health penalties – presumably through the effects of cold and damp – but that outdoor occupations with much physical activity conferred significant health benefits.

Neison carried out a special survey of mortality among those with 'intemperate habits' through sending out questionnaires to insurance companies, asking for information on insured members from medical personnel. He found a very strong mortality gradient, with those having 'intemperate habits' – presumably mainly those addicted to alcohol – having much higher levels of mortality.

Table 12: *Mortality among Persons of Intemperate Habits Compared to that in England and Wales*

Age	*Number Exposed to Risk*	*Died*	*Mortality Per Cent*	*England and Wales Mortality Per Cent*	*Proportion of Intemperance Mortality to that of England and Wales*
16-20	74.5	1	1.342	.730	1.8
21-30	949.0	47	4.953	.974	5.1
31-40	1861.0	86	4.620	1.110	4.2
41-50	1635.5	98	5.992	1.452	4.1
51-60	966.0	62	6.418	2.254	2.9
61-70	500.5	40	7.992	4.259	1.9
71-80	110.0	20	18.182	9.097	2.0
81-90	15.0	2	20.000	19.904	1.0

Source: Neison 1864, p. 204

There are problems with the interpretation of Table 12 – the nature of the sample, its socio-economic and geographical composition – but its findings are plausible: those who drank large quantities of alcohol – and probably smoked tobacco – suffered levels of mortality in some age groups four or five times higher than the general population.

Neison assumed that he had largely refuted the arguments of Farr, Chadwick and other sanitarians, but there is no inconsistency between the importance of disease environment on the one hand, and the role of lifestyle on the other. There is evidence

for the importance of both, and the relative role of these variables will depend upon particular historical and social circumstances.[74]

Wealth and Mortality among Women

The small amount of available evidence on female adult mortality is ambiguous before the twentieth century. Tryon claimed at the end of the seventeenth century that women's health suffered because of their lifestyle:

> … there being hardly any Women in the known-World that are such great Drinkers and lovers of strong liquors as the *English* ... the too frequent drinking of *Wine* and *strong Drinks,* which … makes her lose her way … [and the] Inconveniences the Mother suffers, the Child partakes thereof, both in the time of Pregnancy (or breeding) and whilst it sucks.[75]

He claimed that wealthy women were less healthy than the poor, resulting from their physical inactivity:

> Women ought *not to lie too long in* Bed, as most of them that are of any Quality or Ability do … if they do but use any kind of Exercises, and hereby their Travail in Child-bearing is tenfold more burthensom than otherwise it would be, witness many ordinary Country People, who have nothing the trouble such times as our *fine lazy sluggabed Dames.*[76]

There is no systematic evidence on lifestyle of women in wealthy families. Certainly many of the fashionable women depicted in contemporary pictorial satires were depicted as obese and over-weight.[77] Both Pepys and Parson Woodforde describe in their diaries female guests consuming very generous quantities of food and drink.[78] Woodforde also makes reference to female alcoholics of his acquaintance.[79] Dobson quotes Dr George Buxton's diary for the year 1770, in which "he claimed to have seen many women die miserably" of alcoholism.[80]

Gronow, writing in the Regency period, described how women along with men consumed large quantities of food and alcohol during dinner parties:

> … a perpetual thirst seemed to come over people, both men and women, as soon as they had tasted their soup; as from that moment everybody was taking wine with everybody else, till the close of the dinner; and such wine that produces that class of Cordiality which frequently wanders into stupefaction. How all this eating and drinking ended was obvious, from the prevalence of gout, and the necessity of every one making the pill-box their constant bedroom companion.[81]

Irvine Loudon has presented evidence to show that maternal mortality was as high or even higher among middle-class as it was working-class mothers during the nineteenth and early twentieth centuries, and this was probably partly due to the delivery of babies by medical practitioners with inadequate obstetric practices.[82] Judith Lewis has argued that there were similar problems with the treatment of pregnant aristocratic women, although her research indicates that only about five per cent of women in peerage families died in childbirth in the period before the mid-nineteenth century, similar to estimated levels in the general population.[83] However, there was a marked drop in maternal mortality among aristocratic women in the nineteenth century, much more rapid and significant than that which occurred amongst the general population, which may have been linked to the development of the anti-sepsis movement in the mid-nineteenth century.[84]

Conclusion

The research reviewed in this paper suggests that lifestyle – an excessive consumption of food, alcohol and tobacco, and lack of physical activity – may have been primarily responsible for the high adult mortality of wealthy men. However, there are still a number of unresolved issues and the role of nutrition and poverty in shaping adult mortality still requires further clarification. A more detailed analysis of adult mortality by occupational group would partly help achieve this aim. The method of calculating mortality by tracking married couples between censuses, used with the Bedfordshire sample, is possible for all parts of England with surviving census schedules and parish registers. For example, a comparison between farmers and agricultural labourers for individual parishes would further clarify the role of poverty in determining mortality. Evidence quoted earlier in Table 4 and from late nineteenth-century national censuses indicates that there was no significant difference in mortality between these two occupational groups.[85] We have seen earlier that the life-long poverty of labourers led to physical stunting compared to farmers. It is possible that the effects of poverty among labourers were counter-balanced by the hazards of wealth among farmers – the consumption of alcohol, tobacco and an excess of food. Both groups lived in rural areas and led physically active lives, and explanations of their mortality patterns will require further research into other aspects of lifestyle and cause of death.

The overall evidence considered in this paper provides only minimal support to Wilkinson and Marmot's thesis that social inequality *per se* leads to higher mortality in adults. The absence of a social-class gradient in this type of mortality before the twentieth century indicates that other factors were more significant. We have suggested that lifestyle – excessive consumption of food, alcohol and tobacco, and a lack of physical activity – was central to high adult mortality among wealthy men and women. The data reviewed suggest that there were significant health hazards attached to the ownership of wealth, but given the provisional nature of the evidence, much further research is going to be required before the complex relationship between wealth and mortality can be fully resolved.

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[1] Wilkinson 1996; Wilkinson 1997, pp. 591-5; Marmot 2004.
[2] Davey Smith, Dorling and Shaw (eds) 2001.
[3] Ibid.*;* Harris 2004; Rashad, Gray and Boerma 1995; Lunn 1991.
[4] Razzell and Spence 2004.
[5] Razzell 2006.

[6] For a discussion of place in shaping mortality, see Garrett, Reid, Szreter, and Schurer 2001; Razzell and Spence 2004.
[7] Razzell and Spence 2004, p. 50.
[8] Razzell and Spence 2004, pp. 52-3.
[9] Woods 2000, p. 86.
[10] Razzell and Spence 2004, p. 63. The association between the occupation of fathers and level of premium paid may largely be the result of the sons of wealthy fathers being apprenticed to masters following elite occupations, such as merchants, bankers and goldsmiths.
[11] There was a significant association between region and paternal mortality levels, with the highest mortality in London and the lowest in Scotland and other regions remote from London. See Razzell and Spence, p. 51.
[12] For Chadwick's data on poverty and mortality, see Chadwick 1965, pp. 219-27. For a critique of the methodology of using age of death, see Register General, *Fifth Annual Report* 1842, pp. xxviii-xxxi.
[13] General Register Office, *Fifth Annual Report* 1842, p. 446; General Register Office, *Eighth Annual Report* 1845, pp.192-3*;* General Register Office, *Ninth Annual Report (Folio Edition)* 1846, pp. 236-8.
[14] Woods 2000, p. 234.
[15] Such research is being carried out by Kevin Schurer and associates who are studying a 2 per cent random sample of the population of England and Wales, and tracking individual families between the decadal censuses in the period 1851-1901, and linking this data with information on deaths.
[16] Wilkinson 1989, p. 308; *Independent Inquiry into Inequalities in Health: The Acheson Report*, in Davey Smith, Dorling and Shaw (eds) 1998, p. 348.
[17] Burnett 1968.

[18] Ibid.*;* Heath 1893; Razzell and Wainwright 1973, pp. 4-11.
[19] Harris 2004. The problem with generalisations about the role of nutrition is that some infectious diseases are known to have varied markedly in their historical virulence, and this may have changed the influence of nutrition on resulting mortality. For example, smallpox had a case-fatality of about 5 per cent in sixteenth-century London, whereas by the late nineteenth century this had risen to 45 per cent, and nutrition may have played a different role in the former compared to the latter. For evidence on changes in the fatality of smallpox, see Razzell 2003, pp. 169-78, and for the complex interaction of nutrition and infection in shaping mortality, see Lunn 1991.
[20] Davey Smith, Dorling and Shaw 2001.
[21] Tryon 1683, pp. 313-14.
[22] Tryon 1683, pp. 320, 341.
[23] Powicke 1926, pp. 22-6.
[24] Cheyne 1823, p. 64.
[25] Porter 1991, pp. 325-6, 342.
[26] Porter 1991, pp. 49-50.
[27] Cheyne 1823, p. 65.
[28] Short 1727, p. 39.
[29] Buchan 1769, pp. 100-1.
[30] See, for example, Black 1973, p. 87.
[31] Beresford 1999, pp. 262-3.
[32] La Rochefoucald 1995, pp. 29-31.
[33] Fogel 1992, p. 269.
[34] Seebohm Rowntree 1901, p. 253.
[35] Seebohm Rowntree 1901, p. 254.
[36] Galton 1884.
[37] Galton 1884, p. 267.
[38] Ibid.
[39] Tanner 1981, pp. 111-12.
[40] Floud, Wachter and Gregory 1991, p.178.
[41] Danson 1862, pp. 20-6.
[42] Most evidence points to a U-shaped relationship between body mass index and adult mortality. This suggests that both the malnourished and the over-nourished were at higher risk of mortality. See Fogel 2004, p. 24.
[43] See, for example, Wadd 1829, p.164; Banting 1864.
[44] Sinclair 1833, p. 404.
[45] Quoted in Burnett 1968, p. 166.
[46] Burnett 1968.
[47] Heath 1893, p. 129.
[48] Tryon 1683, p.168.
[49] Tryon 1683, p. 171.
[50] Tryon 1683, p. 223.
[51] Hogarth 1751, p. 32.
[52] Hogarth 1751, p. 6.
[53] La Rochefoucald 1995, pp. 29-31.
[54] Oppe 1923, Plate 44.
[55] Combe 1815, p. 97.
[56] Eden 1797; Davies 1796; Neild 1841; Seebohm Rowntree 1901.
[57] Eden 1797, p. 542.

[58] Heath 1893, p. 187.
[59] Seebohm Rowntree 1901, p. 237.
[60] Seebohm Rowntree 1901, p. 58.
[61] Seebohm Rowntree 1901, p.143.
[62] Smiles 1905, p. 114.
[63] Burnett 1968, p. 199.
[64] The annual per capita consumption of tobacco was as follows: 1791-1815: 1.11 pounds; 1816-40: 0.84 pounds; 1841-65: 1.06 pounds; 1866-90: 1.42 pounds; 1891-1915: 1.92 pounds; 1916-38: 3.13 pounds. These patterns of consumption are similar to changes in per capita income. See Mitchell and Deane 1971, pp. 343-5, 355-8.
[65] Eden 1797; Davies 1796; Neild 1841; Seebohm Rowntree 1901.
[66] Hibbert 1987, p. 559. See also the budgets quoted in Eden 1797, Davies 1796, Neild 1841, Seebohm Rowntree 1901.
[67] Hibbert 1987, p. 554.
[68] Hibbert 1987, p. 553.
[69] Neison 1864.
[70] Neison 1864, p.151.
[71] Neison 1864, p. 38.
[72] Neison 1864, p. 43.
[73] Neison 1864, pp. 54, 55.
[74] Riley 2001.
[75] Tryon 1683, pp. 278, 283-4.
[76] Tryon 1683, pp. 288-9.
[77] Oppe 1923; Murray 1998.
[78] Latham and Matthews 1995; Beresford 1999.
[79] Beresford 1999, pp. 20, 99.
[80] Dobson 1997, p. 246.
[81] Murray 1998.
[82] Loudon 1992, pp. 243-6.
[83] Lewis 1998.
[84] Lewis 1998, p. 33; Loudon 1992.
[85] General Register Office, *Supplement to the Sixty-Fifth Annual Report*, p. cxxxv.