What evidence is there in Surrey for Malthusian checks on population in the early modern period?

"it is employment which creates population: marriages are early and numerous in proportion to the amount of employment"
Arthur Young (1770) (Sharpe 2003 pg 40)

At the end of the fourteenth century, England was seriously overpopulated. England had increased her wealth and standing due to a prolonged period of population growth, but now that growth was beginning to pressurise this new found prosperity. The natural resources of the land and the quality of the industrial technology were very limited and had reduced the opportunity for expansion. An ever-expanding populace would have been high susceptible to the events needed to check this population growth, but early modern society was ill equipped to undertake a period of restrained morality that would have encouraged a period of population stagnancy (Platt 1978).

There is a cycle of growth and reduction that historically population has been subject to. The people of any country rely on the yield of the land to survive, but whilst yields tend to grow in a more linear fashion, population expands exponentially. Malthus believed that when the land could not support the populace, checks occurred, naturally or enforced, to reduce numbers to a level that subsistence could support. For the early modern period sources can be difficult to locate and often do not provide an unbroken record. Records of baptisms, marriages and burials can be a good starting point for statistical analysis and can provide an indication of the wax and wane of the registrating population.

Reverend Thomas Robert Malthus was a scholar who between 1778 and 1826 wrote and published six editions of his treatise "An Essay on the Principle of Population". He wrote about the inequality and interdependencies between population and subsistence. In his Essay he wrote "Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio….By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal…This implies a strong and constantly operating check on population from the difficult of subsistence. This difficulty must fall somewhere, and must necessarily be severely felt by

a large proportion of mankind." (Malthus 2008 pp13). Population generally grows faster than the means of provision of food, and whilst the rich can survive times of paucity, it generally is the poor who suffer.

The cycle generally works on the premise that levels of subsistence limit the levels of population. A larger population would mean a larger number of labourers looking for work; decreasing the value of labour and therefore reducing wages. The ratio of people to consumables increases in times of high population, escalating the prices of foodstuffs thus forcing each labourer to work harder to earn at the same income level as before. At these times of distress, certain checks can happen naturally, or be enforced, to reduce or halt population expansion. The low agricultural wage and surplus of labour offers opportunities for improving agricultural expansion because of additional industry on the land and the chance that additional workers can increase yields. This heightens levels of subsistence until a symmetry is reached with population numbers. Marriage and multiplication is then again encouraged, but only until the balance is disrupted and the cycle begins again.

Malthus described two different types of checks to population growth; preventative and positive. In the category of preventative checks he listed abortion, birth control, prostitution, postponement of marriage and celibacy – all forms of moral restraint the people needed to undertake to reduce numbers. Positive checks included more uncontrollable factors such as hunger, disease and war and Malthus alsos included child mortality in this list.

A number of these checks are practically impossible to study with the records extant from the early modern period. There is little statistical evidence that can document the sexual conduct and morality of the population and the historian is forced to make interpretations and assumptions from the brief glimpses into the early modern society. There is a basic assumption by historians taken from evidence in contemporary sources that the people of the early modern age didn't generally practice contraception and weren't aware of the variety of techniques. From the brief mentions in contemporary literature, it seems that contraception was poorly understood and used rarely, but the demographic historian cannot begin to establish a pattern to ascertain contraception's contribution to Malthusian checks.

Abortion as a Malthusian check is also something difficult to confirm. Again, there are few documentary examples of patterns of abortions carried out. Quaife's work (discussed in Sharpe (2003) pp45) on early modern Somerset suggests that in cases where men were attempting to conceal the pregnancy of their partners, approximately one in five would have suggested the solution of abortion. Much of the evidence for cases of abortion could be found in legal records, but as the legality of the action itself is questionable, the accuracy and omissions of any records must be taken into account and cause consternation when calculating proportions. A similar case can be produced for records of infanticide. Prostitution records are also a grey area, and references are only likely to be found in contemporary literary works or the diaries of the ruling classes and again, possibly in legal records, but ambiguity again causes problems with accuracy. Quaife's work suggests prostitution was evident in rural areas, but they were few and tended to be part-time, but this presumption cannot be held to be accurate for all parishes, and cannot be extrapolated to provide proof of Malthusian checks.

There are a number of ways parish registers can be used to give a general view on the population cycle, but a number of issues need to be taken into consideration. Statistical analysis cannot identify the cause of death and even the actual records themselves may not provide cause of death, but a quantitative analysis can attempt to establish any patterns in registrations. The possibility of a monthly analysis may provide a more informative conclusion, and the comparison of summer and winter deaths may suggest disease related mortality, but this would need to be done on a narrower time period otherwise the data becomes unwieldy and uninformative.

Non-registration of baptisms, marriages and burials through reasons of non-conformity, carelessness, breaks in registration, quality of the extant records and the fact that the registers only record ceremonies carried out by the parish ministers are also factors that can contribute to any inconsistency in data. In Sogner's analysis relating to Shropshire she suggests inflating the recorded figures for baptisms by 15% and marriages and burials by 10% to cover any deficiencies with registration (1936).

The Parish Register Aggregate Analyses provided by Schofield and Wrigley (2003) which provides monthly totals of baptisms, marriages and burials for 404 English parishes from the sixteenth to the nineteenth century were used for this analysis. The data for each Surrey parish was extracted and then

pulled together into annual totals. The graph below demonstrates the result of plotting the annual data for the combined parishes of Surrey.

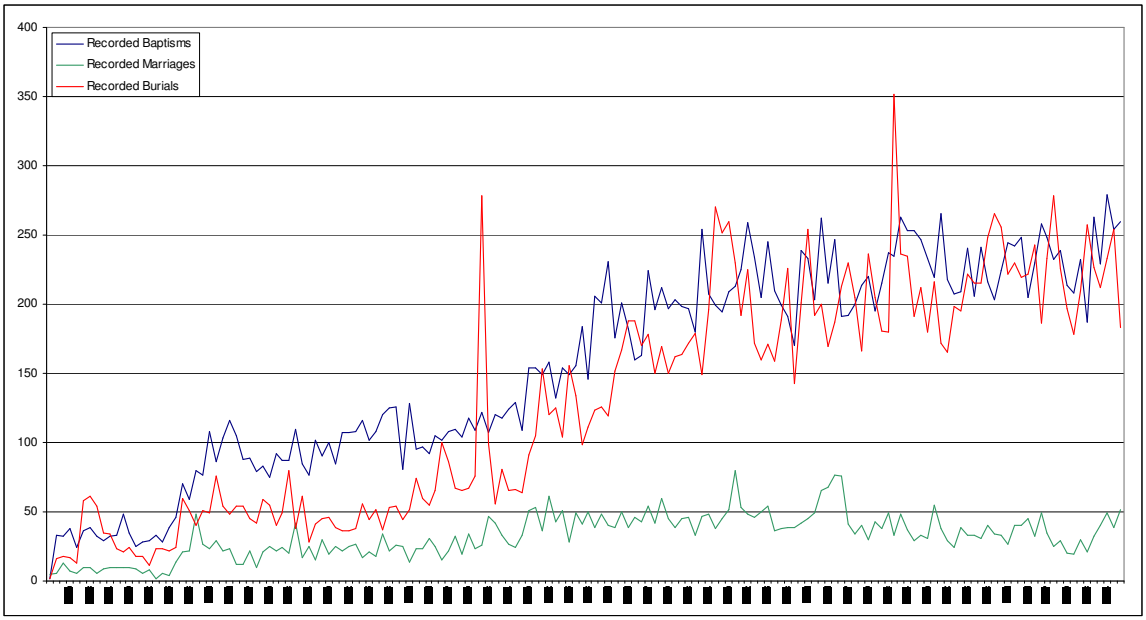

Figure 1 : Annual Recorded Totals for Baptisms, Marriages and Burials for Surrey 1500 to 1699 (taken from Schofield & Wrigley 2003)

Alone this data doesn't provide any exact evidence of Malthusian checks, but offers a glimpse into the fluctuations of registrations. By utilising other data sources available, the historian may be able to compare trends in the registrations and identify points in time where population checks may have occurred.

Subtracting the number of burials from the number of baptisms provides detail of the oscillations in population (as in Figure 2), and this data can communicate the points where population movement drops into negative figures which suggests crises of mortality. The graph shows huge dips for a number of years, the worst in 1603 and 1665, which were both times of known severe plague outbreak.

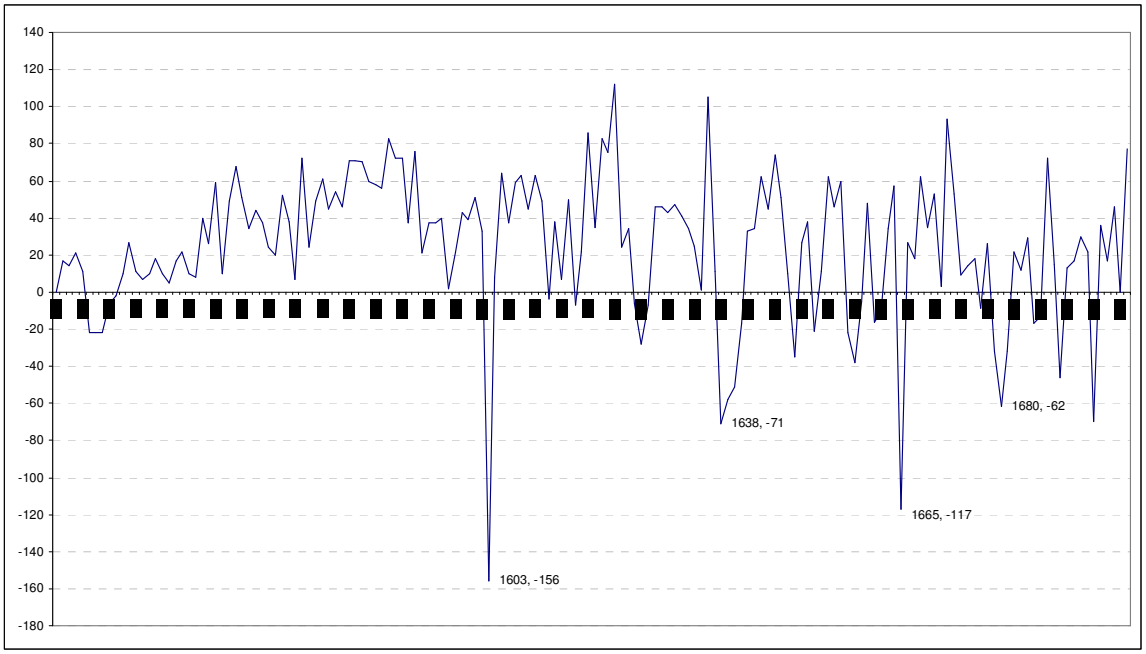

Figure 2 : Annual Recorded Totals for Baptisms minus the Recorded Totals of Burials for Surrey 1500 – 1699 (taken from Schofield & Wrigley 2003)

Whilst baptisms and burials provide the obvious route for demographic analysis, marriage rates are also affected by the wealth of society. The driver for marriage was always economic in early modern England, and in general, couples were reluctant to marry unless they had an adequate and stable economic base. If the nation's economy was poor it meant that it was difficult to create this financial foundation, so couples would marry later, reducing the length of time available to have children, therefore reducing the opportunities for the population to grow. Establishing the check for postponement of marriage would require data for the average age of marriage during the period. Sharpe cites evidence that the mean age of a first marriage of men fell from 1600 until the 1750's suggesting the economic base improved (see Table 1), but the search for supporting material and data relating to age of marriage has been unsuccessful. (Sharpe 2003)

Period	Mean Age of the First Marriage of Men
1600-1649	28 years
1650-1699	27.8 years
1700-1759	26.4 years

Table 1 : Mean Age of the First Marriage of Men 1600-1759

Climate and temperature are often factors cited for restricting population expansion and exceptional societal circumstances can often rise from harvest failures due to bad weather. A fall of one degree centigrade can mean that the growing season of cereals is reduced by three to four weeks. The drop in temperature would reduce yields, causing difficulty for the majority of the population who were dependent on cereals as their staple diet. Early modern agricultural techniques weren't developing fast enough to extend the growing period, improve marginal lands and yields. When the harvests were really bad people sometimes starved, whilst for others, hunger and cold weakened their resistance to disease. A majority of mortality would result from illnesses that would have been survived in times of plenty. (Sharpe 2003). Much analysis has been done including the influence of weather on mortality and the seasonality of mortality by Howe (1972), Tromp (1980), Buchan and Mitchell (1875) and Bull and Morton (1975). Work on variations in viral rates, prices and weather to explain annual fluctuations in death has also been undertaken by Lee whilst Appleby (1975) analysed the relationship between nutrition, bread prices and disease in London but found little evidence to substantiate claims of a relationship. A positive correlation was established between grain price increases and deaths from typhus, smallpox, fever and total deaths, but Appleby's analysis didn't include weather related variables (Galloway 1985).

Temperature data has been recorded for the early modern period and this data is plotted against the parish register data for burials in Figure 3.

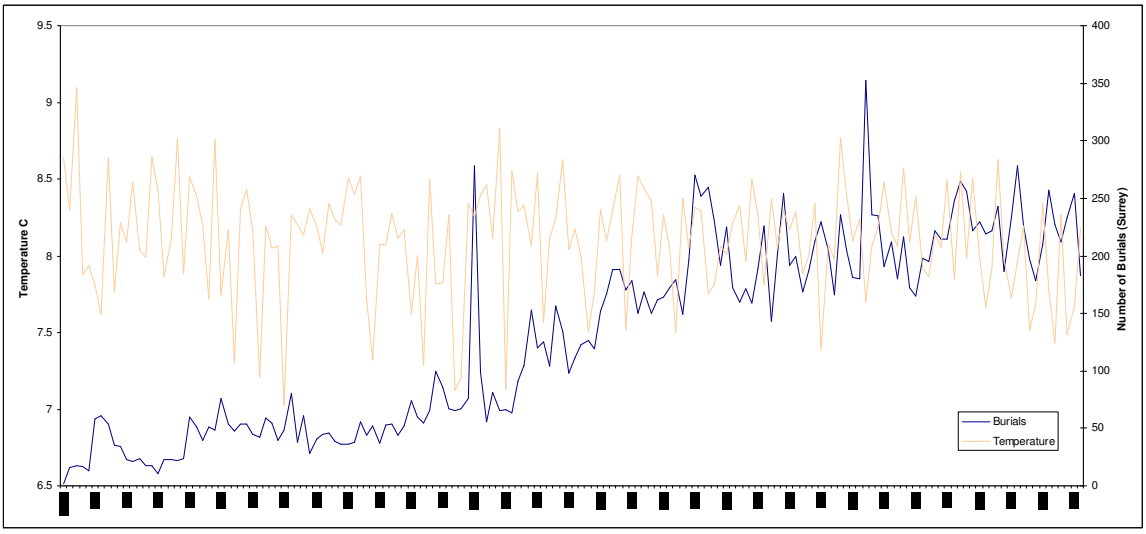

Figure 3 : Comparison of Temperature Changes with Recorded Burials (taken from Schofield & Wrigley (2003) with Luterbacher J et al (2006))

Here is it clear that around 1600 the temperature plummeted to 7ºC and this was followed by a huge peak in the number of recorded burials. The next drop in temperature (seven years later) did not contribute to such a rise in the number of recorded burials, but this may have been because the population was already decimated. It is clear that any drop in temperature may not have had an immediate influence on mortality, but resulted to lasting consequences relating to malnutrition and susceptibility to disease. It is very likely that each and every contemporary disease was individually affected in some degree by any deviation in food supply and weather.

Another set of data that could be used to identify Malthusian checks would be the average wage rates for the period. Again Wrigley and Schofield have collated data providing a real wage index for the early modern population. Comparing the trend in real wages with marriages and burials could give an indication as to the influence of times of dearth on population.

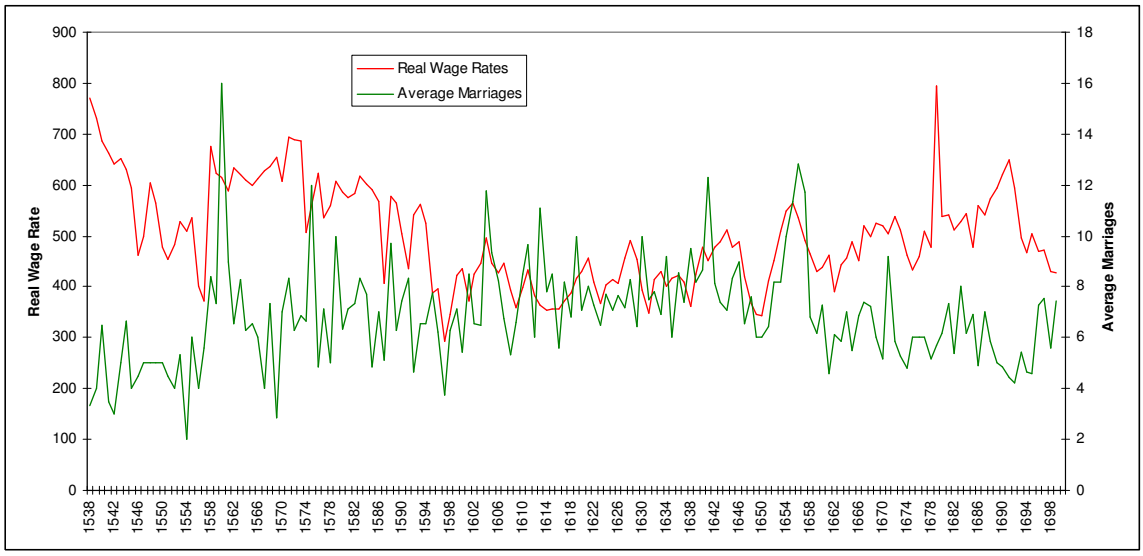

Figure 4 : Real Wages Rates compared with Average Marriages (Schofield & Wrigley (2003 & 1981))

It is difficult to gauge the relationship between wages and marriages, but Figure 4 identifies a number of parallels. There is a peak in wages in 1558 and a resulting peak in average marriages in 1560, a trough in 1597 for both sets of data, and peaks again in 1665 (wages) and 1666 (marriages). These final peaks must also have been influenced by the outbreak of plague and the breaking down of social order.

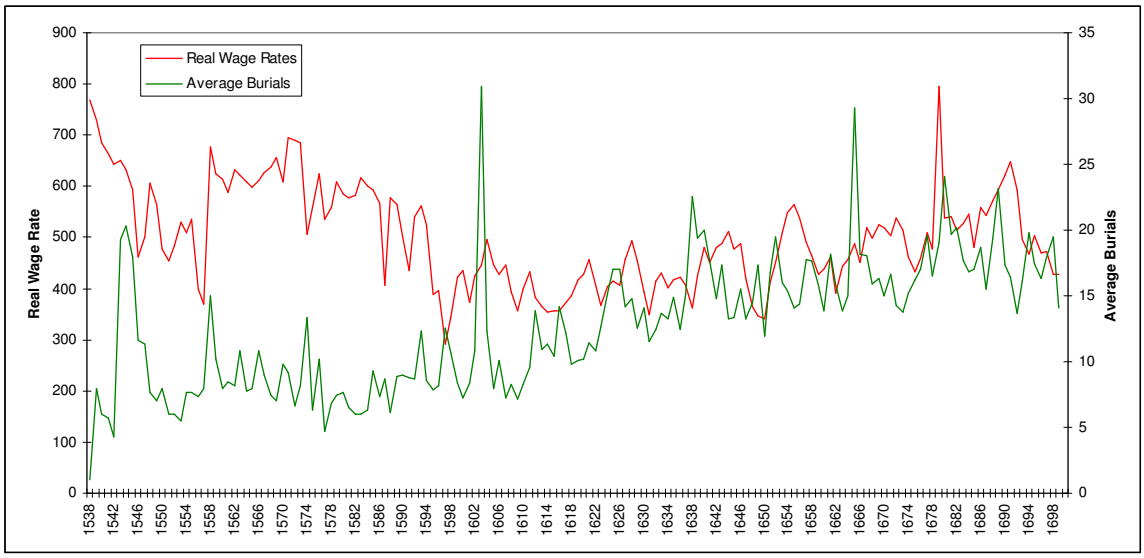

Figure 5 : Real Wages Rates compared with Average Burials (Schofield & Wrigley (2003 & 1981))

With the data as plotted in Figure 5, it is clear to see that a drop is wage rates is often closely followed by a rise in burials, but this pattern does not occur on every occasion.

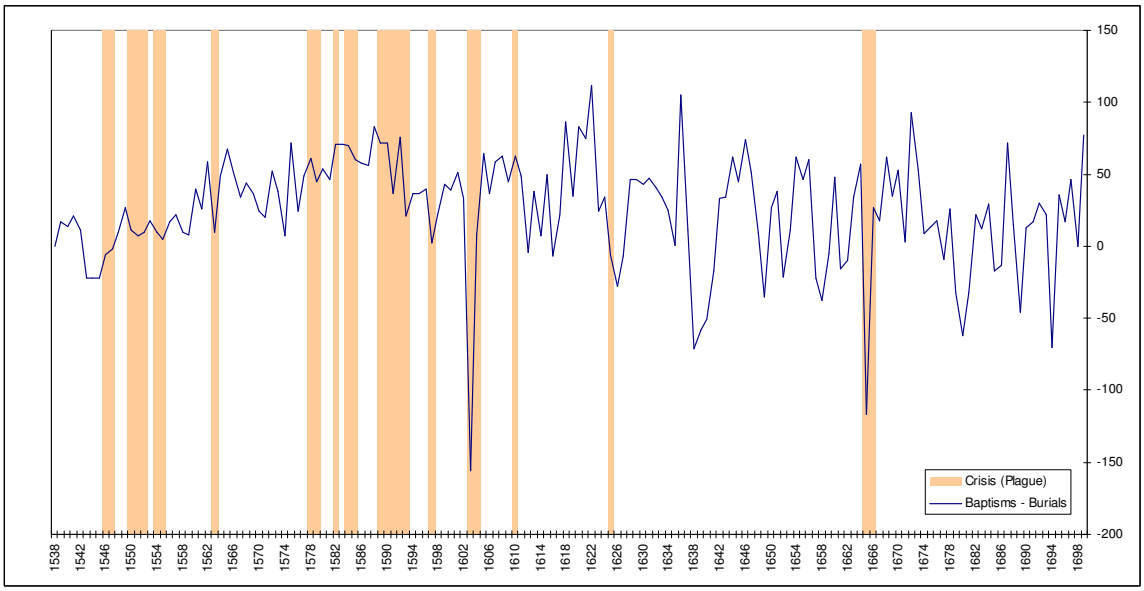

Figure 6 : Annual Recorded Totals for Baptisms minus the Recorded Totals of Burials for Surrey 1500 to 1699 (taken from Schofield & Wrigley 2003) with Plague Years plotted

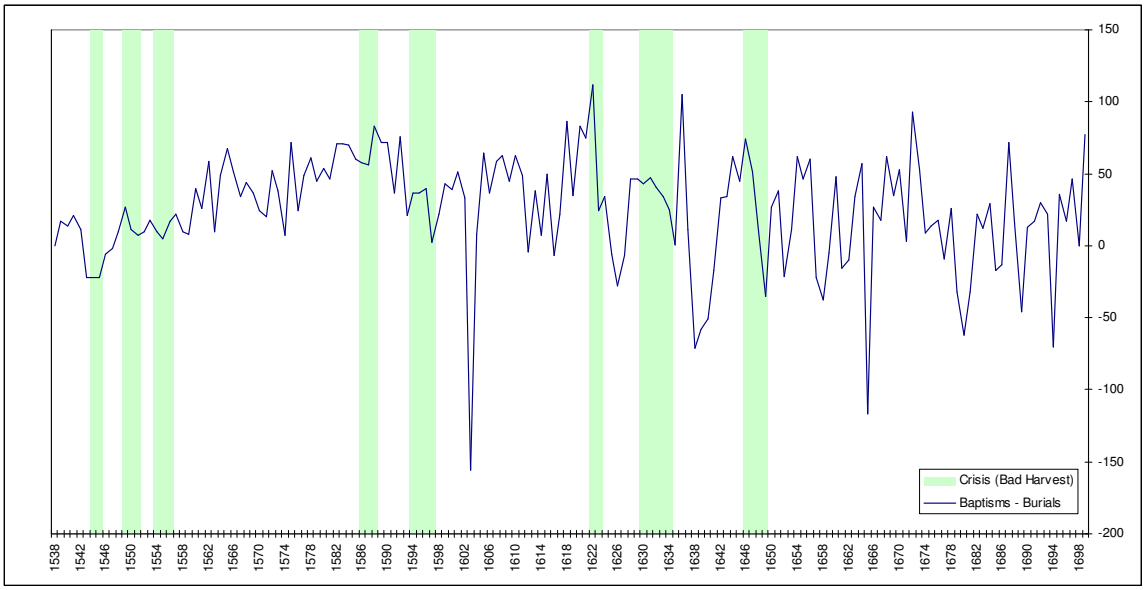

Figure 7 : Annual Recorded Totals for Baptisms minus the Recorded Totals of Burials for Surrey 1500 to 1699 (taken from Schofield & Wrigley 2003) with Bad Harvest Years plotted

A comparison of the recorded crises of plague and bad harvests in England against the pattern of population movements (baptism minus burials) is demonstrated in Figure 7. The plague outbreaks regularly correspond to an almost immediate dip in the population, whilst the bad harvests are often a number of years before any troughs.

There is a need for a much deeper knowledge of demographics than that which can be gained from the recorded baptisms, marriages and burials. Parish registers can be used to attempt to reconstitute families, as per Wrigley and Schofield's work, but this will often provide atypical results that may be inaccurate. There is a huge body of data providing demographic analysis, but the proof of Malthusian checks needs to be teased out. Statistical data for the early modern period is complicated to extract, but use of parish registers and the work already done by Wrigley and Schofield could provide numerical data. Further research could include analysis of infant mortality and changes to the fertility rate. A monthly analysis could establish the effects of disease such as diphtheria (a winter disease), dysentery, measles, scarlet fever, smallpox, typhoid (autumn) and typhus (winter and spring) as these will all be affected by factors including temperature and harvest yields.

The difficulty with establishing Malthusian checks is the cyclical nature of population movement. Weather affects yields and health, which in turn influence employment and wealth, which shapes

mortality and fertility, which has an influence on population numbers which then affects employment, wealth and the accessibility of subsistence and the cycle continues. England's ability to improve subsistence levels was limited and food supply failed to keep up with population growth so pairing this agricultural inefficiency meant it was hard for the population to respond to and redeem themselves from environmental crises. (Bucholz 2004)

The evidence offered here indicates the presence of checks to the movement of population numbers, but as the factors are so inextricably linked, it would be careless to posit that this is proof of Malthusian checks. The evidence suggest that events in the early modern period may not necessarily directly relate to Malthusian ideas, but none the less have a profound influence on population movements.

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