Quaker Studies 17/2 (2013) [149-202]
ISSN 1363-013X

Members and Descendants of the Newgarden Meeting, County Carlow— Demographic Profiles 1600–1899: Part 2

Peter J.F. Coutts
Former Director of the Victoria Archaeological Survey and former Hon Sen. Research Fellow, Prehistory Section, History Dept., LaTrobe University, Victoria, Australia

Abstract

This paper, presented in two separate parts, defines a select number of demographic markers for the population that comprised members of the Newgarden Meeting, County Carlow, Ireland and their descendants 1600–1900. These in turn were compared with those derived by Vann and Eversley (1992) for the Quaker population of Ireland at large with the objectives of identifying consistencies and/or evidence for regional variation within a genetic context. In part 1 the sources of data, their utility and approach to analysis were discussed and it was concluded that there were some constraints on their usage for analytical purposes. Part 1 also dealt with aspects of age at marriage, delayed marriage, occupation and marriage catchment analysis.

Part 2 deals with family size, births including birth interval analysis, birth management, fertility and some aspects of age analysis. It was found, for example, that over time family sizes became smaller, marriages were delayed, lifespan gradually increased and families were sometimes planned.

While many of the results outlined in the two sections of this paper parallel those of Vann and Eversley there are sufficient differences in several of the demographic markers to suggest there may have been some variation in rural Ireland from the national trends. In so far as the Newgarden/Carlow population is concerned and in contrast with results derived from the analysis of the national population, these include a tendency for females to marry earlier and males later, a greater proportion of females marrying under the age of 20 and after 1800 a trend for males to marry much younger women and a consistent trend to reduce the sizes of families over time. These and the other results, then, invite analysis of data from other regions to test this hypothesis

Keywords

Demography, age specific marital fertility index, Vann and Eversley, birth interval analysis, mortality, birth management, smallpox, Newgarden.

INTRODUCTION

Part 1 focused on introducing and discussing the selection and shortcomings of the data to be used in erecting a demographic profile for members and descendants of the Newgarden/Carlow Meeting originally located in County Carlow, Ireland for the period 1650–1900. The sample population was drawn essentially from County Carlow, County Kildare and Queen's County but included descendents who ended up residing in other counties and in countries other than Ireland and who were not always members of the Religious Society of Friends. Part 1 also examined residency, occupations, and marriage patterns. In Part 2 more complex issues are tackled such as birth patterns, family size, age specific marital fertility, birth management and some aspects of mortality. At each stage of the analysis the results are compared with those of Vann and Eversley (1992) for the entire Quaker population of Ireland (abbreviated NDB) for the period 1650–1850 but subject to the limitations of small samples and differences in the way samples were chosen.

BIRTH PATTERNS

When Friends married, children usually followed shortly afterwards. In this section an attempt is made to determine if there were variations in the so-called 'natural' rhythm of births and if so to identify them. Variation implies birth management. In Part 1 some evidence was presented for delayed marriage, an act which if it implies earlier celibacy can be regarded as an elemental strategy to control births. If and when couples decided to limit the numbers of children, then various strategies must have been deployed to achieve their targets. Late marriages may have accelerated birth sequences, but early marriages allowed the luxury of spacing. Limiting family sizes by implication would have to involve contraception, abstinence from intercourse or some other kind of birth management scheme. When targets were achieved before fecundity[1] dissipated, were stopping strategies deployed? And if high birth rates were needed to meet targets did couples resort to wet nursing to hasten a return to ovulation?

Where there were attempts to manage births one would expect to see evidence of this from birth interval analyses. If, for example, the birth of the first child occurred say three years after marriage, and this kind of delay was noted in several broadly contemporary marriages, then delayed first birth could be implied as a pattern. On the other hand if there was a pattern where most first born children arrived within about 15 months of marriage, this would be regarded as a feature of a 'natural' birth sequence (one where there is no conscious attempt to interfere with the normal course of reproduction). Stopping or limitation strategies might manifest themselves in birth sequences that terminated well before a woman's fecund period is expected to end (around 45 years of age for healthy women). Spacing can be difficult to separate from limitation. However when there is wide separation of births over the fecund period, and the periods of separation tend to be greater than those associated with a natural birth sequence, then spacing can

sometimes be implied. Again delayed marriage might result in fewer children, but if a couple had a target in mind they may have been pressured to reproduce resulting in shorter birth intervals.

AVERAGE FAMILY SIZE

Average family size by TP for all marriage ranks is summarised in Table 1 together with those for the NDB. The values are calculated for all marriages regardless of date of marriage. In the case of Vann and Eversley's estimates it is not clear whether they are for first marriages only or include both first and second marriages. Notably their estimates were published with standard deviations which prove to be quite large, sufficient to umbrella all TP averages for the Newgarden data within one standard deviation of the mean for each respective TP.

Table 1: Average family size (no. of children) per household, no. of households in brackets.

TP	Av family size M1 and M2	Av family size M1	Av family size M2	Mean family size cited by Vann and Eversley★
1600–1649	7.03 (38)	7.05 (37)	6.00 (1)	
1650–1699	6.80 (168)	6.85 (158)	5.90 (10)	5.4
1700–1749	6.12 (185)	6.23 (177)	3.75 (8)	6.1
1750–1799	5.99 (111)	6.04 (106)	5.00 (5)	6.1
1800–1849	4.82 (85)	4.84 (2)	4.33 (3)	5.6
1850–1899	2.74 (77)	2.67 (70)	3.43 (7)	
1900–1949	2.98 (55)	3.00 (53)	2.50 (2)	
1950–1999	2.36 (22)	2.36 (22)		

★1992: 173, Table 4.12

Key: M1 = first marriages, M2 = second marriages.

The Newgarden data show a steady and consistent decrease in family size from the first to the last TP (which are both poorly represented), a trend that is not apparent in the Vann and Eversley data. In fact when their data are re-tabulated by wives' age at marriage (1992: 137, Table 4.3) the most fertile periods turns out to be the 1750–1799 TP for wives aged between 20–24 years with a mean of 8.7 and 1700–1749 for wives aged between 25–29 with a mean of 6.9 children. Comparable data for the Newgarden population are shown below:

Table 2: Average no. of live births by age of wife at marriage (sample numbers in brackets).

Mother's age at marriage	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
< 20	6.0 (1)	8.3 (19)	6.6 (25)	7.0 (9)	6.7 (3)	
20–24	9.5 (2)	6.7 (48)	6.5 (50)	7.5 (24)	5.6 (25)	2.9 (12)
25–29	7.5 (2)	6.8 (12)	6.4 (22)	5.4 (14)	4.5 (11)	2.9 (17)
30–34		6.5 (4)	6.1 (7)	4.2 (17)	5.3 (4)	1.5 (4)
35–39			2.5 (2)			

Sample numbers are poor by comparison with those used to compile Table 1 and entries for the first TP can be ignored. Nevertheless the downward trend in family size over time is apparent for all age of marriage ranks. Females who married before the age of 24 years had the largest families through most TPs. Again the means, while differing slightly from those published by Vann and Eversley, all lie within one standard deviation, and the bump noted for the 20–24 year old marriage rank in the 1750–1799 TP of their data is apparent in both the under 20 (av. 7.0) and 20–24 (av. 8.7 cf. 7.5) year rank for the Newgarden/Carlow data.

Another difference between the two sets of data is the incidence of marriages in the under 20 rank; there are some occurrences for Newgarden/Carlow data but none for the NDB. This may account for the slightly lower average family sizes in the 20–24 age range of the Newgarden data compared with those for the NDB. The NDB data suggest that family size diminished as the age of marriage increased for all TPs and with one possible exception this is the case for the Newgarden/Carlow data. The exception is the 25–29 year rank for the 1650–1699 TP where there is a slight rise from 6.7 to 6.8 children. However the sample size (just 12) for this rank is too small to argue for a trend.

The sample of second marriages is too small to enable any concrete conclusions to be drawn. The data, as one might expect, show a downward trend in family size over time and the average family sizes per TP are smaller than their counterparts for first marriages.

One can conclude from these data that the Newgarden/Carlow population followed the national trend although both their fertility and average family sizes were more moderate. The last TP is, of course, outside the scope of Vann and Eversley's study. Given the massive socio-economic and political changes that had taken place in Ireland previously one might suspect that the profiles derived for this TP would be similar to those for the Irish population as a whole. This is not the case. Age of marriage did steadily increased over this TP,[2] and while fertility tended to increase in many regions of Ireland after 1871, it decreased in Leinster (McKenna 1974: 699). Surprisingly, average family size changed little throughout the late nineteenth century despite the increasing age of marriage (Walsh 1970: 149). The mean numbers of children by age at marriage for populations drawn from rural Ireland are much higher than those for the Newgarden/Carlow population in all age categories (Anderson 1998: 3, Table 1). Upon reflection, it is not surprising that there is some variation between the data sets. In general, the Newgarden/Carlow sample was made up of persons drawn essentially from the middle class whereas those for the national sample were selected from a population dominated by working class Catholics.

AGE SPECIFIC MARITAL FERTILITY (ASMFI)

Age specific fertility is a measure of the number of live births in quinquennial intervals for women of similar ages divided by the number of years the mothers were in observation through each interval. It is expressed as a number per 1000 years lived by women per interval (Vann and Eversley 1992: 130). Wrigley et al. (1997: 358) express the ratio in a slightly different way. If B_{leg} is defined as the

total number of legitimate live-born children of a particular couple over the mother's period of fecundity, Exp_f is the exposure of the fecund married woman in woman–years lived and Exp_{nf} is the exposure of non-fecund married woman-years lived (the period in observation after her last birth up to marriage end) then the ASMFI for a quinquennial interval can be derived as follows:

$$ASMFI = (\sum B_{leg} * 1000) / \sum (Exp_f + Exp_{nf})$$

Table 3: Age specific marital fertility rates for descendants of the Newgarden Meeting by age of mother at each birth (numbers in brackets = $\sum B_{leg}$). All data, first and second marriages, calculated using periods of observation.

Mother's age at each birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
< 20	40(1)	16 (6)	25 (10)	21 (6)	5 (1)	
20–24	40 (1)	270 (100)	228 (91)	152 (44)	173 (32)	73 (11)
25–29	480 (12)	417 (148)	334 (132)	354 (101)	356 (64)	193 (28)
30–34	440 (11)	432 (134)	449 (164)	350 (98)	358 (59)	208 (26)
35–39	240 (6)	344 (93)	305 (99)	359 (88)	263 (42)	120 (12)
40–44	240 (6)	186 (41)	182 (51)	195 (43)	96 (12)	
45–49	100 (2)	55 (8)	13 (3)	24 (4)	8 (1)	
>49		9 (1)	5 (1)		10 (1)	

Table 4: Age specific marital fertility rates for descendants of the Newgarden Meeting by age of mother at each birth (numbers in brackets = $\sum B_{leg}$). Complete families only, first marriage only and husband and wife definitely alive at age 45 years.

Mother's age at each birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
< 20		13(2)	12(2)	25(4)		
20–24		193 (29)	212 (35)	188 (30)	125 (10)	71 (5)
25–29	600 (3)	400 (58)	352 (58)	363 (58)	350 (28)	215 (14)
30–34	400 (2)	432 (54)	420 (63)	290 (45)	427 (32)	200 (10)
35–39	200 (1)	374 (43)	344 (43)	408 (51)	343 (24)	143 (5)
40–44	400 (2)	209 (23)	235 (27)	245 (27)	111 (5)	
45–49		57 (4)	13 (1)	38 (3)		
>49		18 (1)				

Results of the analysis are presented in Tables 3-4 and Fig. 1. The first of these two tables shows the data tabulated for all families that have completed birth sequences with at least 80% of the birth dates known, incorporated first and second marriages and used the period of time in which the mother is 'in observation' (up to 45 years of age) as the period of exposure to pregnancy. The second table uses data for families that have completed birth sequences and where at least 80% or more of the birth dates are known, and includes first 'completed' marriages only (husband and wife still alive at age 45 years). Notably the behavior of the data is similar in both tables with slightly more pronounced peaks in the more conservative data set. Change is apparent. The most fertile ages for all TPs are for mothers in the 25–34 year range and the least fertile for mothers under 20

years or over 45 years old. Fertility rates tend to decrease over time for all age groups with the highest values in the first TP (but small samples). However relatively high fertility rates occur in the 1650–1699 and 1750–1799 TPs and the slight increases in fertility for women in the 30–34 year old age group of the 1800–1849 TP over those in the preceding TP are notable but hardly convincing given the sample size.

Referring to Table 3 the maximum values of the indices drop from the 400s (1600–1699) to the 300s (1700–1849) and into the 200s in the last TP. The peak values in Table 4 occur in the same age ranks but the values themselves are more erratic, although the behavior and values of the index are broadly similar for several of the age ranks over the period 1700–1799.

Tables 5-8 show the same data expressed as a function of the age of mothers at marriage inclusive of all data,[3] first and second marriages, families where at least 80% of the children's birth dates are known and using 'in observation' periods to calculate the ASMFIs. Figures 2-5 depict the most conservative data set graphically (first marriages, completed families, mother still alive at aged 45 years). The trends apparent in the two data sets are very similar.

Figure 1: ASMFI for completed families, first marriage only, wife (and husband) still alive at age 45.

Higher fertility rates are sustained for at least 2 ranks in the conservative rendition whereas the ASMFI drops off moderately after reaching a peak in the 20–24 year rank in the other data set. The difference can probably be attributed to sampling deficiencies, as the samples available for the under 20 marriage rank are poor.[4]

Table 5: Age specific fertility rates for descendants of the Newgarden Meeting by age of mother at marriage and age at each successive birth: Mother's age < 20 (numbers in brackets = $\sum B_{leg}$) All data, first and second marriages, using 'in observation' periods only.

Mother's age at each birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
< 20	200 (1)	67 (5)	118(10)	171 (6)	100 (1)	
20–24	200 (1)	500 (42)	529 (45)	486 (17)	600 (6)	
25–29	600 (3)	529 (37)	329 (28)	433 (13)	400 (4)	
30–34		431 (28)	338 (27)	320 (8)	300 (3)	
35–39		311(14)	200 (15)	280 (7)	300 (3)	
40–44		114 (4)	138 (9)	133 (2)	100 (1)	

Table 6: Age specific fertility rates for descendants of the Newgarden Meeting by age of mother at marriage and age at each successive birth: Mother's age at marriage 20 -24 (numbers in brackets = $\sum B_{leg}$) All data, first and second marriages, using 'in observation' periods only.

Mother's age at each birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
20–24		267 (56)	242 (46)	230 (23)	219 (23)	222 (10)
25–29	600 (6)	475 (95)	411 (76)	580 (58)	470 (47)	222 (10)
30–34	400 (4)	438 (70)	444 (71)	350 (35)	306 (26)	200 (6)
35–39	400 (4)	350 (49)	267 (36)	350 (28)	188 (16)	40 (1)
40–44	300 (3)	157 (18)	122 (14)	154 (10)	62 (4)	
45–49	400 (2)	43 (3)				

Table 7: Age specific fertility rates for descendants of the Newgarden Meeting by age of mother at marriage and age at each successive birth: Mother's age at marriage 25 -29 (numbers in brackets = $\sum B_{leg}$) All data, first and second marriages, using 'in observation' periods only.

Mother's age at each birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
25–29	300 (3)	250 (15)	318 (27)	400 (22)	229 (8)	300 (18)
30–34	700 (7)	483 (29)	600 (51)	418 (23)	543 (19)	255 (14)
35–39	200 (2)	300 (18)	400 (30)	400 (18)	314 (11)	150 (6)
40–44	300 (3)	220 (11)	277 (18)	156 (7)	50 (1)	
45–49		89 (4)	363 (2)	29 (1)		

Table 8: Age specific fertility rates for descendants of the Newgarden Meeting by age of mother at marriage and age at each successive birth: Mother's age at marriage 30–34 (numbers in brackets = $\sum B_{leg}$). All data, first and second marriages, using 'in observation' periods only.

Mother's age at each birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
30–34		250 (5)	400 (10)	338(22)	333 (5)	200 (4)
35–39		550 (11)	520 (13)	400 (24)	500 (5)	133 (2)
40–44		400 (8)	240 (6)	267(16)	400 (4)	
45–49		100 (1)		55 (3)	100 (1)	
>49		100 (1)			100 (1)	

Several features are apparent from these data. First, there are considerable variations in the shapes of the fertility curves. The general forms of the first and last TPs are similar, while those of the 2nd and 3rd TPs share some similarities but are unlike those of the 1st and 4th TPs. Taken at face value it would appear that during the 1st and 4th periods, mothers opted for high birth rates shortly after marriage, but thereafter tempered their rates of childbirth (as suggested by the rapid fall off of the ASMFI curves). However, during the 2nd and 3rd TPs, relatively moderate fertility rates appear to have been sustained over longer periods of time suggesting different birth management strategies were being employed.

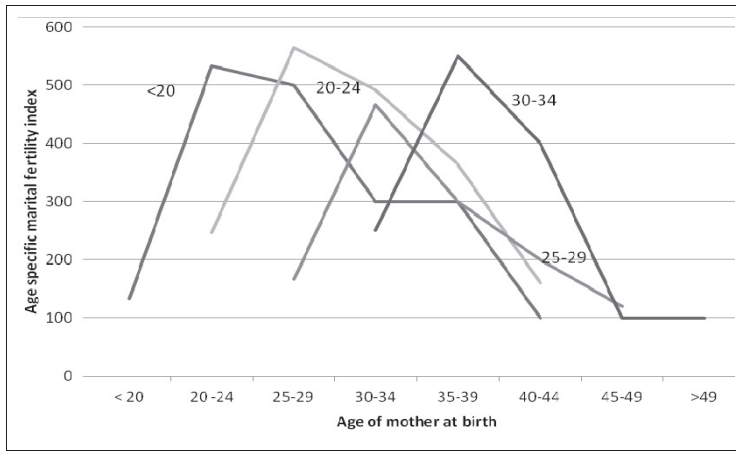

Figure 2: ASMFI by age of mother at marriage, 1650–1699, completed families first marriage, completed marriages.

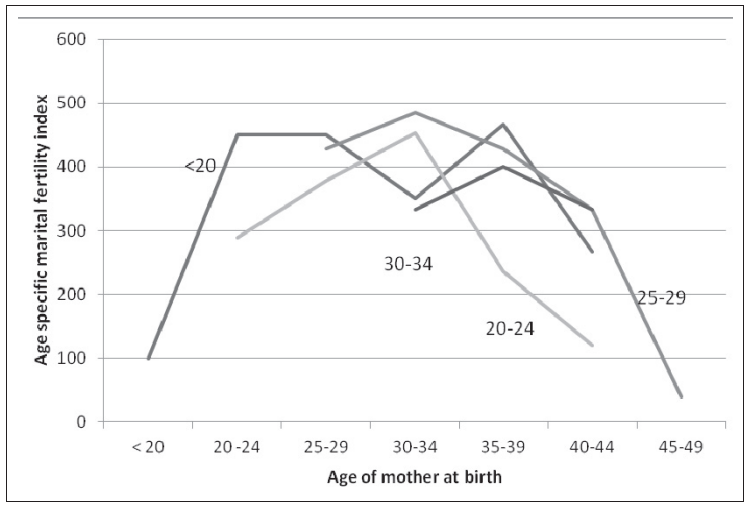

Figure 3: ASMFI by age of mother at marriage 1700–1749 completed families first marriage, completed marriage.

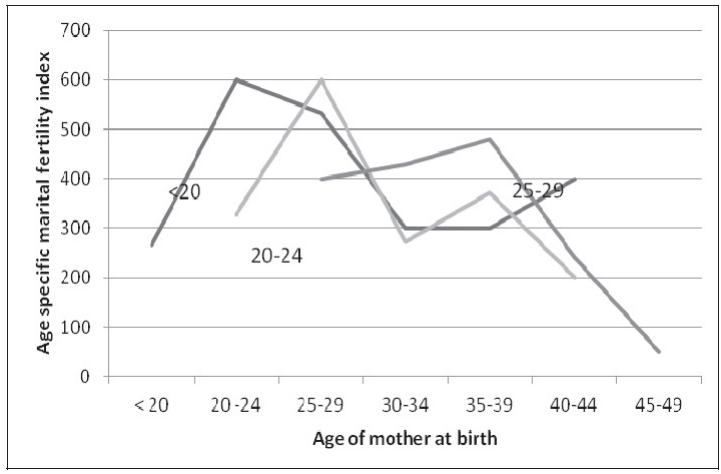

Figure 4: ASMFI by age of mother at marriage 1750–1799 completed families first marriage, completed marriage.

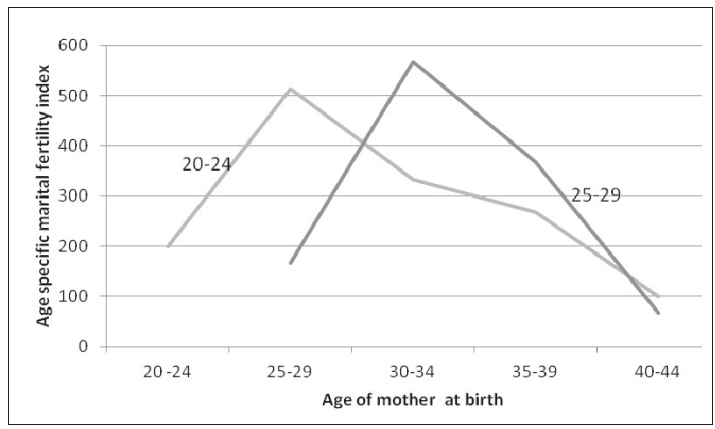

Figure 5: ASMFI by age of mother at marriage 1800–1850 completed families first marriage, completed marriage.

Secondly there is no sharp or sudden cut-off of the index at either ends of the age group rankings: births tend to get under way in the age rank of marriage, reach their peaks in the following rank and peter out by the time the 45–49 rank is reached. Thirdly the maximum values of the ASMFI tend to be roughly similar for all ages at marriages within each TP except perhaps for the 1750–1799 TP where the peak values tend to drop away. Fourthly there tends to be a high degree of consistency within each of the TPs as witnessed by the shapes of ASMFI curves which are similar for all marriage ranks. This suggests that similar birth management strategies were being deployed by women of all marriage ranks within each TP. Finally there is no obvious evidence in these data for birth limitation or some cultural perception of a cut-off age for giving birth.

Vann and Eversley (1992: 138-39, Table 4.4) have published comparable age specific fertility rates for wife's age at first marriage (for three ranks, 20–24, 25–29 and 30–34) for Irish Quakers at large, but with quite different results. Beginning with data for the 1650–1699 TP, the peak values are somewhat less than those for the Newgarden/Carlow and except for the 25–29 rank the peak periods of fecundity occur in the same age rank as marriage. In the following TP peak ASMFI are slightly higher than their Newgarden/Carlow counterparts, but unlike the latter their ASMFIs tend to drop away gradually from their peaks before descending sharply, suggesting comparatively more sustained periods of fecundity. Likewise while there are a few similarities between the two data sets for some of the marriage ranks in the other two TPs there are more differences. For example women that married in the 20–24 rank for the 1800–1850 Newgarden/Carlow TP reached their peak fecundity in the following age rank after which fertility drops away gradually. By contrast, in the Vann and Eversley data set peak fecundity is reached in the same age rank and thereafter it drops away much more slowly until the 35–39 age rank before descending sharply.

The Vann and Eversley data suggest that the predominant birth management strategy was to reproduce as soon as possible after marriage as the highest values of the index tend to occur in the same age rank as the age of marriage of the mother. The Newgarden/Carlow data on the other hand is indicative of a more relaxed approach to bearing children following marriage (as the peak indices tend to occur in the age ranks following those for the ages of marriage). Another difference between the two data sets is in the way the tails of Vann and Eversley distributions tend to cluster following a more coherent approach to zero fecundity. It is doubtful that the differences between the two sets of data can be explained by differences in sampling sizes or sampling bias which raises the possibility of regional or local variation.

The wide variation in fertility rates and family sizes through time, also highlighted and discussed by Vann and Eversley (1992: 146ff.), invites explanation if not speculation. The mere fact that family size dropped over time raises a suspicion that family planning of some sort was responsible as opposed to 'something in the water'. As shown below it is unlikely that factors such as diet and nutrition, disease, economic conditions or local disasters such as crop failure played a significant role in determining or modulating fecundity; the Quaker community as a whole was fairly well insulated from such factors, being essentially middle class with some depth of resources, physical, fiscal and spiritual, to cope with emerging dangers (Vann and Eversley 2002: 57).

Large families were a feature of early Quaker culture. As discussed in Part 1, this could have been burdensome on parents who had to find means to provide dowries for daughters and to position sons for their futures. For families with modest resources this may have been difficult. After deceased estates were divided between siblings there may have been an incentive among legatees to limit the sizes of their own families to better enable them to provide adequately for their children. It is difficult to show that this happened in practice, if indeed at all. It is easier to document what could happen when family limitation was not practiced:

Table 9: No of children in each successive generation of the Watson family of Kilconner

Heir	Date	Generation	Children	Males	Females
John	1650–1710	1	10	4	6
Samuel	1686–1762	2	10	5	5
John	1713–1750	3	10	5	5
John	1743–1783	4	7	5	3
John	1774–1845	5	12	4	8

Table 9 summarises data for a family that showed little inclination to limit family size; indeed family size increased in the 1750–1799 TP. The Watson's joined the ranks of the gentry early in the eighteenth century and from thereon the fiscal history of the family was one of gradual decline, acquiring various estates it is true, but accumulating debt as well. Ultimately the family fell into financial ruin. The Watson family may not be typical as it has been established that, on average, family size for the Newgarden/Carlow population did decline over time. It has to be remembered also that Friends abhorred debt and were generally frugal, so that the traditional members of the Society possibly utilised better inheritance strategies to provide for their families. Emigration may have played a role in reducing pressure on scarce family resources but the degree to which it took place and its impact on the demographics of the Meeting, if any, for all the TPs remains undocumented at this time.

The period from 1750 to 1800 is credited with being an era of accelerated population growth in Ireland (Cullen 1972: 118) and in respect of Quaker communities; increases in average family size and fertility rates during this period suggest that they were participants in the process. In practice there is no way to confirm this as aggregate population figures for particular communities are not available. A decrease in mortality rates has sometimes been suggested as an explanation for population growth in Ireland between 1750 and 1800, brought about by a reduction in susceptibility of the population to disease through inoculation programs, better economic conditions and the addition of the potato to the Irish diet. As we will see below, there were some changes in the mortality rates of the Newgarden/Carlow population during this period, but they are not significant enough to support such an argument. Moreover, it is most unlikely that the potato played any role at all in determining family size or decisions about marriage in Quaker families, as potatoes were regarded at the time as the food of the poor (Cullen 1972: 70, 118) and Quakers did not fall into that category.

Sterile marriages were another factor that could have affected birth strategies. Vann and Eversley (1992: 145, Table 4.6) have discussed this aspect and come up with some statistics for Irish Quakers at large. What they found was that there were very few sterile marriages and that there was nothing in their results that could explain anomalous Quaker birth patterns. Although statistics are available for the Newgarden/Carlow data they are not presented here, since evidence emerged during data collection that some of the data were suspect.

A number of other factors could have affected birth patterns; for example the rates of marriage, changes in male marriage patterns over time, variability in the ease with which marriages could be contracted and the possible impact on marriage patterns if and when there were imbalances in the sexes.

The rate of marriage take-up can only be assessed when accurate statistics are available for the numbers of persons who died confirmed spinsters or bachelors. Unfortunately reliable figures are not available from the Newgarden/Carlow data as the marital status of many members of the population is not known. And of the instances where it is known, many are children or adolescents who had died prematurely. However, the problem might be viewed in another way by looking at individual families where marital status is known for all of its members. With such data it is possible to determine whether there is any diminished or accelerated impetus to marry through time. Taking the Watson and Lecky (1st generation 1649–1707) families for arguments sake, one can look at the eligibility of children to marry in each successive generation (must be alive at age 20 to 25 depending on sex) and whether they did marry. The results suggest that persons who were eligible to marry up to and including the 3rd generation did so, but thereafter a few singles begin to appear in both families. It is, of course, not possible to generalise based on anecdotal data as there are many reasons why persons might have gone through life unmarried. It does, however, raise the possibility that, if there were increasing numbers of unmarried persons around during the 1750–1799 TP, married siblings may have been encouraged to produce larger families by way of compensation.

There are no aggregate figures upon which to assess sex imbalance (see above). Friends did not participate in wars and as far as is known, their health and mortality do not seem to have been affected by crop failures that occurred occasionally during the eighteenth century. Disease did, however, take its toll, especially small pox (see below). There are several references in Friends literature to deaths of persons from the Newgarden Meeting, but none describe a catastrophic event. Nor is there any reason to suppose that the disease was sex selective. During the second half of the seventeenth century some members were locked up for periods of time, mostly men, for failing to pay tithes, but these events would have little impact on fertility patterns. In fact, inmates were allowed occasionally to receive visitations and/or were released on parole. Emigration, mentioned above, could have affected sex balances, but its impact is likely to have been minimal since there is no evidence that there were mass migrations of Quakers from the Meeting. In summary there seems to be no reason for assuming there might have been significant sex imbalances at any time during the period under study.

It did, however, become harder for Friends to marry in the first half of the eighteenth century. The procedures for marriage became very cumbersome often resulting in long delays before marriages could be solemnised (Vann and Eversley 1992: 83-84; Greaves 1997: 344ff.). Delays of three months or more were normal and sometimes they could be a lot longer. To some extent the rigors of the marriage procedure led an increasing number of couples to employ the services of a priest to marry them. Again by the middle of the eighteenth century incidences

of marriages between members and non-members had increased. There was reluctance by established members of the Society to accept either of these two realities. The prohibition that had been in place preventing Friends from marrying outsiders was restrictive (as discussed in the forgoing), often resulting in members seeking wives or husbands in other counties (Larson 1999: 139). If at any time there had been a relaxation in some of these restrictions a wider selection of partners may have become available and it is not inconceivable that in a somewhat less assertive religious environment (or complete removal from its influence) there may have been aberrations in traditional fertility rates manifested as slightly higher numbers of live births per family. However, if this was the case it did not result in earlier marriages (as one would have expected); indeed the average age for males at marriage increased during the 1750–1799 TP.

The ASMFI is relatively low for the second half of the nineteenth century for all age groups. For that period there are zero data for females who married under 20 years and of those that married in the 20–24 and 25–29 year ranges, the highest average ASMFIs tend to be in the 25–29 rank. The average ASMFI of 197 for women married between 15 and 45 from the Newgarden/Carlow sample 1850–1899 TP is considerably lower than for the contemporary female population at large in 1871: County Carlow (273), Queen's County (248) and County Kildare (328) (Walsh 1970: 151). In that year some 28% of all females aged 20–29 were of married status in County Carlow, compared with 43.1% for women aged 15–45 for the Province of Leinster as a whole (1970: 148, 151). Under the influence of the Catholic Church, celibacy was high in the Province. Indeed the fertility rate among women at large changed little over the next few decades but their age at marriage increased (McKenna 1974: 702). The reasons for these changes can be attributed to a range of factors aside from those operating on the Newgarden/Carlow population.

It is instructive to compare what was happening to the demographics of American Friends during the eighteenth century as they had close ties with the Irish Quaker communities and it is possible they may have influenced each other's demographics. Both communities were subject to stress but for different reasons. One major difference, however, was that American Quakers had access to land. Consequently they were less prone than their Irish counterparts to marriage restrictions and financial problems that could arise because of restrictive inheritance customs. Wells (1971) analyzed a relatively small group of Quaker families from the regions of New York, New Jersey and Pennsylvania pre- and post-Civil War. He found that there was a significant drop in completed family size between c. 1731 and 1756–1785 (7.51 cf. 5.12) and a very slight increase in the average age of marriage for women (22.14 cf. 22.94). The ASMFI also decreases over time for women in all age groups to 45 years, and women who married after age 25 had higher fertility rates than those who married earlier. Of particular interest was the fact that Quaker women had a much lower total fertility rate (5.3) than American women as a whole (7.0, 1971: 81). Wells went on to argue that family limitation was responsible for these shifts in demographics, the first evidence of which appeared during what he calls the 'revolutionary period' (1731–1755).

Although the Irish and American data sets are not directly comparable because they use different TPs, they share some common characteristics such as declining fertility and family size over time. Moreover, average family sizes pre- and post-1750 are quite comparable as are some of the ASMFIs for select age groups. Wells offers no explanation for the demographic changes he has identified and he makes no mention of hereditary issues as a possible causative factor. Yet here we have reasonably solid evidence for birth management in the mid-eighteenth century in a population with similar cultural traditions to those of their Irish counterparts.

BIRTH MANAGEMENT OR 'NATURAL' BIRTHS?

At this stage none of the foregoing explanations or suggestions satisfactorily explains the fertility data. Perhaps the most logical, and this time testable, explanation is that Friends also exercised some degree of control over the way births were managed. Management options available to Friends have been discussed in detail by Vann and Eversley (1992: 144ff.) and it will suffice to limit this discussion to a consideration of whether there is any evidence in the data for family limitation such as stopping and/or spacing.

A stopping strategy is implied when there is evidence that a deliberate attempt has been made to curtail births before the termination of a woman's fecund period. This is not to be confused with a situation where birth numbers are restricted because of the death or otherwise of one of the marriage partners during the woman's fecund period. If one makes the assumption that the fecund period expires around age 45 and it can be demonstrated that births ceased before the mothers reached that age, stopping can be implied. Admittedly this is a very loose hypothesis as there are other possible explanations for early cessation of births. For example, the mother may have become sterile or developed a medical condition that prevented conception or the father may have contracted medical problems that affected sperm production or resulted in erectile dysfunction. Nevertheless, it is worth pursuing as such cases should be well and truly masked out statistically if there are real trends. The average ages at which mother's gave birth to their last child by age at marriage and TP are summarised in Tables 10-11 together with the age specific fertility index for age of mother at the birth of her last child. Sample numbers are small so that any inferences drawn from these data must be regarded with caution.

Table 10: Age specific fertility rates for descendants of the Newgarden Meeting for birth of last child (Numbers in brackets = $\sum B_{leg}$), first and second marriages inclusive.

Mother's age at last birth	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
20–24		6 (5)	6 (5)	2 (1)	2 (1)	12 (4)
25–29	20 (1)	15 (12)	12 (10)	9 (6)	15 (6)	18 (6)
30–34	20 (1)	14 (11)	19 (16)	14 (9)	22 (9)	33 (11)
35–39		26 (21)	22 (19)	23 (15)	39 (16)	36 (12)
40–44	40 (2)	31 (25)	36 (31)	44 (29)	20 (8)	
45–49	20 (1)	6 (5)	4 (3)	6 (4)		
>49		1 (1)			1 (1)	
Totals	5	80	85	66	41	33

Table 11: Average age of mother at birth of last child (years).
Sample numbers in brackets. Completed families only.

Mother's age at marriage [1st M]	1600–49	1650–99	1700–49	1750–99	1800–49	1850–99
< 30 years	35.1(3)	39.4 (28)	36.8 (38)	37.2 (24)	36.9 (16)	30.5 (19)
>= 30 years		45.8 (3)	42.4 (4)	41.3 (8)		35.9 (2)

The data suggest the 40–44 rank was the one where most birth sequences were terminated from 1650–1799, and 35–39 for the later TPs. Table 11 shows a downward trend from 1650–1699 for mothers who married under the age of 30, and notably the averages are all under 40 years of age, suggesting that family limitation strategies were being deployed. Little can be said about the mothers who married after the age of 30 as the sample numbers are really poor, but there is a downward trend from the 1650–1699 TP. Vann and Eversley's samples are not much better (1992: 151, Table 4.8). Their means for mothers who married 30 years and over at last birth are of the same order of magnitude as those for the Newgarden/Carlow data, but for mothers who married under 30 years they are considerably higher. Their data suggest few differences between the means for marriages under 30 years in contrast to the Newgarden/Carlow data. While the data in Tables 10-11 suggest that stopping strategies may have been progressively employed by Newgarden/Carlow families from early on, one cannot be certain as the veracity of the results is compromised by poor sample numbers. Supporting evidence is needed.

Another approach to this problem, elaborated by Vann and Eversley (1992: 150), is to assume that the fertility profiles for all women are basically the same (starting high and reducing with age to zero around aged 45), and that if no conscious attempt is made to limit the size of the family then women of the same age should reproduce at the same rate regardless of when they married. Though somewhat dubious, this hypothesis can be tested with the modest purpose of seeking trends.

Some idea of what a 'natural' fertility curve would look like can be gleaned from Wrigley et al.'s (1997: 453 Fig. 7.6) compilation and graphical presentation of ASMFIs for English Parishes by single year.[5] Essentially it is a curve that slowly drops away from an average ASMFI of about 400 for women 20 years of age to around 200 for women 40 years of age (gradient of about -10 ASMFI units per year) and thereafter dropping away to zero for women aged 50 (gradient of -20 ASMFI units per year). The point is that the curve itself gradually deteriorates.

In order to pursue this approach it is necessary to revisit the data for an age specific fertility index expressed as a function of age of mother marriage (see Figs. 2-5 above). Do the data support the idea that mothers of the same age exhibited similar fecundity regardless of age of marriage? Data have been assembled for mothers that gave birth when they were in the 30–34 year and 35–39 year ranks for each TP for the Newgarden/Carlow data set and for mothers that gave birth in the 35–39 rank for the Vann and Eversley data (Table 12). In general there are

wide fluctuations in the ASMFI for all ages (of mother) of birth rankings in both data sets but some degree of correlation between the values of the ASMFIs (e.g. in the 1700–1749 TP). The data do not support a hypothesis that married women of similar ages in this population shared similar fertility patterns or conformed to a so-called 'natural' fertility regime: there is far too much variation in the ASMFIs.

Table 12: ASMFI for mothers aged 30–34 and 35–39 at birth of child by age at marriage (completed families, first marriage).

	Newgarden/Carlow	Newgarden/Carlow	Vann and Eversley	
Mother's age at marriage	Mother 30–34 years old at birth	Mother 35–39 years old at birth	Mother 35–39 years old at birth	TP
< 20	300	300		1650–99
20–24	492	364	350	
25–29	467	300	350	
30–34	250	550	425	

	Newgarden/Carlow	Newgarden/Carlow	Vann and Eversley	
Mother's age at marriage	Mother 30–34 years old at birth	Mother 35–39 years old at birth	Mother 35–39 years old at birth	TP
< 20	350	467		1700–49
20–24	453	236	350	
25–29	486	429	300	
30–34	333	400	380	

	Newgarden/Carlow	Newgarden/Carlow	Vann and Eversley	
Age of mother at marriage	Mother 30–34 years old at birth	Mother 35–39 years old at birth	Mother 35–39 years old at birth	TP
< 20	300	300		1750–99
20–24	273	371	380	
25–29	429	480	470	
30–34	200	500	600	

	Newgarden/Carlow	Newgarden/Carlow	Vann and Eversley	
Mother's age at marriage	Mother 30–34 years old at birth	Mother 35–39 years old at birth	Mother 35–39 years old at birth	TP
< 20				1800–49
20–24	333	267	380	
25–29	567	367	270	
30–34	200		400	

Having said that, the general behavior of most of the fertility curves (as measured by lines of best fit), although out of synchronism with one another, follow the form expected of a natural fertility curve after they peak.[6] Thus variations in the slope of these curves, for example plateaus, may signal variations in birth strategies. The steep inclines at the beginning of the graphs suggest that newly married couples may have delayed starting families or that there was some under registration of the first few children. Again mothers marrying under the age of 20 appear

to finish having children before their fertile periods lapsed and before those who married later. These data suggest that specific birth strategies may have been deployed. Taking first stopping strategies. If they were being used one would expect them to manifest as abrupt falls or deviations in or from the fertility curve or as a truncation of the curve before the end of the period of fertility (ending at about 45 years of age). If spacing was being deployed one would expect the curve to plateau or change gradient and/or drop off sharply (stopping strategy) followed by a change of gradient. Such features are found in the Newgarden/Carlow data and are summarised in Table 13 together with comparable data extracted from Vann and Eversley for Irish Quakers at large (see Vann and Eversley 2002: 139, Table 4.4).[7] Notably for this exercise the most conservative sources have been used (first marriages, complete families).

Table 13: Identification of regions of the fertility curves where stopping/spacing of children may be in evidence. Numbers such as 25–34 indicate the age rank of the mother at birth of child, 40+ means there was a significant drop in ASMFI starting from the preceding age rank and (-40) is the gradient of the fertility curve, mostly the last portion or tail of the curve. ( )⋆ are gradients of lesser degree detailed for comparison and do not imply specifically stopping or spacing.

1650–99	Newgarden/Carlow data		Vann and Eversley data	
Mother's age at marriage	Stopping	Spacing/stopping	Stopping	Spacing/stopping
< 20	25–34 (-60)	20–29		
20–24	35+ (-60)	25–34	35+ (-60)	20–39
25–29		30+	35+ (-55)	25–34
30–34	40+ (-60)	35–45	35+ (-60)	30–39

1700–49	Newgarden/Carlow data		Vann and Eversley data	
Mother's at marriage	Stopping	Spacing/stopping	Stopping	Spacing/stopping
< 20		20–39		
20–24	35+	30–39	40+ (-60)	20–34 spacing 34–39
25–29	40+ (-60)	30–44	35+ (-60)	25–34
30–34	40+ (-70)		35+ (-55)	30–39

1750–99	Newgarden/Carlow data		Vann and Eversley data	
Mother's age at marriage	Stopping	Spacing/stopping	Stopping	Spacing/stopping
< 20	40+ (-36)	24–29 (-15)⋆ 30–39		
20–24	39+ (-40)	30–39	35+ (-50)	30–39 spacing 20–24
25–29	39+ (-40)	25–39	35+ (-65)	30–39 20–34
30–34	40+ (-37)			

1800–49	Newgarden/Carlow data		Vann and Eversley data	
Mother's age at marriage	Stopping	Spacing/stopping	Stopping	Spacing/stopping
20–24	39+ (-40)	25-39		20-39 spacing 35+ (-65)
25–29	39+ (-50)			25–34 spacing 30-39
30–34				30-44 spacing

There is no certainty in these interpretations. Plateaus at the peaks of the fertility curves may simply be part of a 'natural' distribution. However, their gradients are more likely to give some clue as to whether natural birth patterns were modified, but in order to use these, one would need to have some idea of what a natural fertility curve for Irish Quakers looked like. In the absence of such information and for arguments sake let us suppose that the fertility curve presented by Wrigley et al. (1997: 453) could be used as our model, bearing in mind that they terminate the period of potential fertility at 50 years, as opposed to 45 years in this study. Thus the end of our theoretical curve would terminate with a more severe slope. The steepest gradient in the Wrigley et al. curve is minus 20:1 so that we might conservatively speculate that any gradient over say minus 30:1+ would signal an aberration of some sort in the fertility pattern. Gradients in the range minus 10:1 to minus 29:1 could probably be interpreted as belonging to the so-called natural fertility curve. The gradients at the tail ends of the fertility curves and of those sections where there were intermediate falls are detailed in the above table. Some are very substantial. The results of an analysis of both data sets, utilising the foregoing criteria, suggest there were aberrations in the birth patterns with evidence for curtailment of births and possibly for spacing in all four TPs. The two data sets are not entirely in accord as to the provenance of these events but there are periods within which events coincide.

The strong positive gradients in the fertility curves by contrast are probably indicative of periods of accelerated births, presumably prompted by a desire to get on with the business of producing children. As has been noted already, with one or two exceptions most of the fertility curves for all TPs reach their peak in the age ranks following the one when marriage took place.

In summary, then, it seems that these data do convey some information about management of births. First, it is quite clear there were no dramatic collapses of the fertility curves at any time between 1650 and 1850 and for any particular age at marriage. Basically, however, the earlier one married the earlier child bearing stopped and in the case of mothers marrying before 24 years of age they stopped in the 40–44 year rank, before their counterparts that married later. The shapes of the curves and their lack of homogeneity probably indicate that birth strategies varied over time. Sharp peaks followed by sharp falls can be regarded as perturbations around a theoretical fertility curve, indicative of particular birth patterns at that time, for example issue in quick succession perhaps followed by pauses in the birth sequence. Where the curves flatten off after steep falls spacing becomes a

possibility. The thesis that women of similar ages were equally fecund regardless of the age of marriage finds little support from these data, a result that could be construed as an argument in itself for the prevalence of diverse birth strategies.

While the foregoing analysis provides some presumptive evidence for management of births, it is not conclusive or specific enough to identify how they were being managed. Consequently there is a need to press on and view this problem from other perspectives such as through an analysis of birth intervals. The key aspects here are the spacing between births, the interval between marriage and birth of the first child, and the spacing of last births. Table 14 is a summary of the average birth intervals (days) for the first five children by TP. The availability of sample numbers has limited the analysis to five birth intervals because thereafter the data are spasmodic and insufficient to provide reliable statistics. The same data, with several more birth intervals, are shown graphically in Figure 6.

Table 14: Average birth intervals (days) for the first five births (sample numbers in brackets).

Age Group	Birth interval 1	Birth interval 2	Birth interval 3	Birth interval 4	Birth interval 5
1600–49	392 (11)	731 (27)	880 (26)	898 (29)	1101 (27)
1650–99	562 (124)	740 (137)	808 (124)	820 (121)	822 (100)
1700–49	620 (144)	643 (130)	809 (115)	922 (104)	795 (90)
1750–99	588 (82)	749 (79)	653 (71)	720 (64)	749 (51)
1800–49	676 (60)	710 (5`3)	790 (49)	759 (45)	919 (34)
1850–99	554 (5 7)	1013 (43)	1413 (24)	1316 (11)	1497 (5)
1900–49	752 (39)	951 (37)	1214 (24)	1036 (10)	1649 (5)
1950–99	858 (7)	944 (17)	1260 (6)	916 (1)	

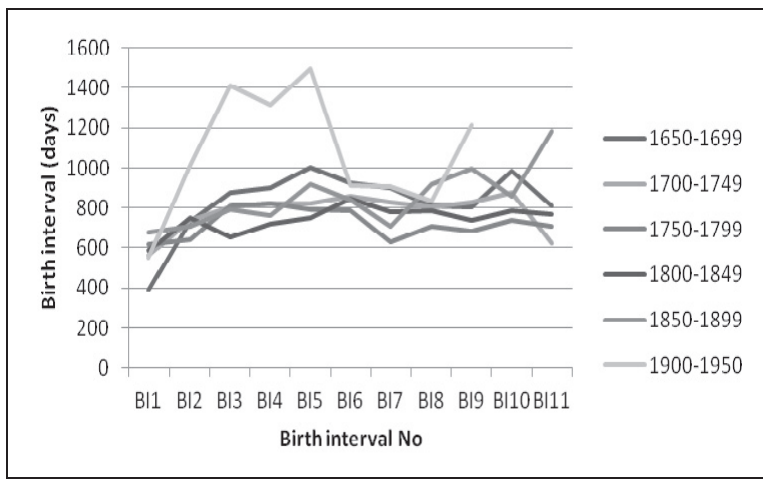

Figure 6: Average birth interval (days) by TP.

Considering first the interval between marriage and first birth. In general the interval increases through time from 1650–1649 although there is some undulation in the curve, for example a longer average delay occurs during 1700–1749 rs) compared with the previous TP (about 1.5 years). However, looking at the spread of figures across the table one can readily discern a major difference in birth patterns for the periods before and after the 1850–1899 TP. The data suggest that some form of birth management was being used from 1850 onwards, as the second and subsequent births are well spaced and quite different from those in earlier TPs. The data from the 1600–1649 and 1650–1699 TPs when compared with those in later TPs also are suggestive of a spacing strategy. Otherwise for the intermediate TPs (1700–1849) the birth patterns appear to be similar, with spacing of second and subsequent births at around 2 years, a pattern that one would expect when births were not being manipulated.

Tables 15–17 break the same data down by age of mother at marriage for three TPs: 20–24, 25–29 and 30–34 years. While some data are available for the 30–34 rank, the samples available for the birth intervals are generally too small to yield reliable results (the maximum sample number is only 17). The contrast between the magnitude of birth intervals before and after the 1850–1899 TP is again evident in the behavior of the first birth and subsequent intervals for the 20–24 TP. The first birth patterns for mothers that married in the 20–24 and 25–29 year ranks are similar with slightly greater average birth intervals for the 1700–1749 and 1800–1849 TPs. The trend in the 30–34 year rank for the 1700–1749 TP is for much reduced birth intervals starting with a delay of less than one year for the first child. However, in the following TP where the figures are slightly more reliable, there is a very long delay in first birth (about 2.0 years) followed by similar delays between subsequent births. As one would expect the average first birth intervals tend to decrease as the age at marriage increases for all TPs.

There are also suggestions of spacing within the data for the 1650–1699 and 1700–1749 TPs for mothers married in the 20–24 year old interval, more so in the latter TP where the birth intervals are considerably higher than those of earlier and later TPs. The same trend can also be seen in the 1650–1699 TP for mothers that married in the 25–29 age range.

In summary the results of the birth interval analysis tend to support the contention that birth management strategies were deployed from time-to-time, most likely spacing, possibly during the periods 1650–1699 for women that married in the 25–29 year old interval, in the 1700–1749 TP for women in the 20–24 year old range, in the 1750–1749 TP women in the 30–34 year old range and certainly in the TPs from 1800 onwards for women in all age groups. Again there is a tendency for the first birth interval to reduce as the age of marriage increases in most TPs. The 1700–1749 TP is one exception, where the first birth interval is comparatively high for women that married in the 20–29 year age ranks. Shortening birth intervals raises the question of what role wet-nursing may have played in birth management, but unfortunately there is a void in documentation on this topic.

Table 15: Average birth intervals (years) by age of mother at marriage: 20–24 years old.

TP	Birth interval 1	Birth interval 2	Birth interval 3	Birth interval 4	Birth interval 5
1650–99	1.43 (48)	1.83 (45)	2.13 (40)	2.09 (36)	1.91 (29)
1700–49	2.06 (47)	1.82 (43)	2.42 (42)	2.48 (36)	2.33 (31)
1750–99	1.44 (24)	1.95 (22)	1.75 (21)	1.56 (19)	1.83 (16)
1800–49	1.88 (23)	2.51 (19)	2.05 (17)	1.93 (14)	2.55 (12)
1850–99	1.50 (11)	2.10 (7)	4.76 (5)	2.06 (3)	3.69(2)

Table 16: Average birth intervals (years) by age of mother at marriage: 25–29 years old.

TP	Birth interval 1	Birth interval 2	Birth interval 3	Birth interval 4	Birth interval 5
1650–99	1.05 (11)	2.01 (11)	1.76 (9)	1.70 (10)	1.97 (23)
1700–49	1.67 (18)	1.55 (15)	1.62 (15)	2.04 (13)	1.68 (12)
1750–99	1.23 (13)	1.55 (12)	2.17 (12)	1.89 (9)	1.66 (7)
1800–49	1.53 (10)	1.62 (9)	2.32 (9)	2.79 (7)	2.25 (7)
1850–99	1.37 (13)	3.14 (12)	3.56 (6)	3.45 (2)	

Table 17: Average birth intervals (years) by age of mother at marriage: 30–34 years old.

TP	Birth interval 1	Birth interval 2	Birth interval 3	Birth interval 4	Birth interval 5
1650–99	1.11 (4)	2.84 (4)	1.54 (4)	2.51 (2)	1.86(2)
1700–49	0.99 (3)	1.24 (3)	1.48 (2)	1.93 (3)	1.61 (3)
1750–99	2.00 (17)	2.16 (12)	1.54 (12)	2.98 (12)	1.92 (7)
1800–49	1.09 (5)	1.44 (2)	1.25 (2)	1.28 (3)	2.13 (3)

Vann and Eversley (1992: 157, Table 4.10) have published the results of a birth interval analysis for all Irish data, only part of which are directly compatible with the Newgarden/Carlow data as they have amalgamated ranks below 24 years of age and those between 25–34 presumably to increase the sizes of their samples. However, their results for marriages, all ranks combined, are directly comparable but in general quite different. The schisms between the lengths of birth intervals above and below the 1800–1850 TP are readily apparent, but the averages for the most part differ from those in the Newgarden/Carlow tables. For example, first birth intervals are much lower in the Vann and Eversley data and there is a more orderly increase in the size of the intervals as one progresses from 1st to 5th births for most TPs. What can be said is that their data suggest that births were being managed during the 1650–1699 TP and possibly during other periods, including the 1800–1849 TP.

Notably the average first birth intervals for the Newgarden/Carlow data (18.5, 1650–1699 to 22.2, 1800–1849) are more in line with those of Quakers from Southern England (20.9, 1650–1699 to 19.4, 1800–1849) than for Ireland as a whole (14.4, 1650–1699 to 16.0, 1800–1849) and in the context of relativity, one suspects that at least some of the Newgarden/Carlow and Southern English

Quakers families deliberately delayed starting their families after marriage. In the case of the Newgarden/Carlow data, if indeed the data can be interpreted in this way, it was a practice that extended over most TPs regardless of the age of marriage. While Vann and Eversley have highlighted the differences between the first birth intervals of Irish and Southern English Quakers, when viewed in the context of these results, the Irish figures are not so out of kilter. Quite possibly evidence of regional variation in Ireland has been smothered in the statistical treatise of the larger analysis.

There is yet another way that the problem of identifying whether some kind of birth management was being deployed can be detected. This involves assuming from the outset that all births were natural or non-Malthusian (that is there was no conscious effort to limit pregnancies) and by making a number of assumptions about termination of fecundity. The approach is based on an exercise described by Wrigley et al. (1997: 358ff.), wherein they were able to demonstrate for their English Parish (non-Malthusian) population:

$$\text{ASMFI (conventional)} = (B_{leg}/Ex_{pf}) \star Fec_{entry} \star Fec_{sub}$$

where B_{leg} = number of legitimate live births, Ex_{pf} = exposure during the fecund period, Fec_{entry} = entry level fecundity, Fec_{sub} = subsequent fecundity and B_{leg}/Ex_{pf} = fecund marital fertility rate.

In order to calculate the fecund marital fertility rate (FMFR), however, one needs to know when fecundity ceased and to do this Wrigley et al. used the last birth (employing data from completed marriages only) as the signal of approaching sterility and assumed that a woman remained fecund for an average period of 17.5 months following the birth of her last child (1997: 363). They also made allowance for the expected deterioration in fecundity as a woman approached the end of her anticipated period of fertility by assigning an arbitrary but reducing number of 'fecund months' to women whose last births occurred between 45 and 50. Their method has been followed here except that the fertility cut-off has been assumed to be 45 and the fecund periods of last births that occurred after the mother turned 40 years of age have been adjusted down from 17.5 months up to age 40 to zero at age 50.

Wrigley et al. tested these assumptions by comparing the duration specific fecund marital fertility index (calculated using the above-described assumptions) with the fecund fertility rate calculated from the average birth intervals[8] over the life of the marriage and found good correlation. Recall that the overriding assumption here is that sterility followed last birth + post-last birth adjustment for remaining fecundity. However, if 'sterility' was initiated by the adoption of a stopping strategy it would not be sterility in the biological sense because the women would still be fecund and capable of giving birth to children. In such instances last births as a signal for the onset of sterility could be misleading and FMFRs for the last portions of the curves would be incorrect. If there were aberrations in the data caused by the imposition of birth management strategies we would not expect to get convincing correlations between the duration-specific FMFR and its counterpart calculated from birth intervals.

To put this argument to the test the relevant data for each TP and by age at marriage are set out in Table 18 below. Following Wrigley et al. the mid-points of the birth intervals were allocated to duration of marriage age rankings in order to reduce rank bias (1997: 363).

Table 18: Average birth intervals, duration specific marital fertility index by age at and duration of marriage.

		Duration of marriage (years) 1650–99				
Wife's age at marriage		0–4	5–9	10–14	15–19	20–24
20–24	Birth Int (mths)(1)	16.5	24.7	21.1	31.1	18.0
	Est FMFR (2)	727.3	485.8	568.7	568.7	666.7
	DSFMFR (3)	626.7	542.9	600.0	314.3	200.0
	(2)/(3)	1.16	0.89	0.95	1.81	3.33
25–29	Birth Int (mths)(1)	22.5	25.6	28.8	33.6	
	Est FMFR (2)	533.3	468.8	416.7	357.1	
	DSFMFR (3)	400.0	466.7	350.0	150.0	
	(2)/(3)	1.33	1.00	1.19	2.38	
30–34	Birth Int (mths)(1)	17.0	27.2	16.2	63.5	42.9
	Est FMFR (2)	705.9	441.2	740.7	189.0	279.7
	DSFMFR (3)	600.0	400.0	266.7	200.0	200.0
	(2)/(3)	1.18	1.10	2.78	0.94	1.40

		Duration of marriage (years) 1700–50				
Wife's age at marriage		0–4	5–9	10–14	15–19	20–24
< 20	Birth Int (mths)(1)	22.6	33.3	23.7	25.2	35.8
	Est FMFR (2)	531.0	360.4	506.3	476.2	335.2
	DSFMFR (3)	400.0	450.0	450.0	350.0	333.3
	(2)/(3)	1.33	0.80	1.13	1.36	1.00
20–24	Birth Int (mths)(1)	22.8	27.3	26.7	46.6	12.1
	Est FMFR (2)	526.3	439.6	449.4	257.5	991.7
	DSFMFR (3)	411.8	422.5	357.1	200.0	333.3
	(2)/(3)	1.28	1.04	1.26	1.29	2.98
25–29	Birth Int (mths)(1)	18.2	22.6	28.2	20.3	
	Est FMFR (2)	659.3	531.0	425.5	591.1	
	DSFMFR (3)	666.7	533.3	500.0	350.0	
	(2)/(3)	0.99	1.00	0.85	1.69	
30–34	Birth Int (mths)(1)	18.7	30.5	27.9		
	Est FMFR (2)	641.7	393.4	430.1		
	DSFMFR (3)	600.0	266.7	300.0		
	(2)/(3)	1.07	1.48	1.43		

		Duration of marriage (years) 1750–99				
Wife's age at marriage		0–4	5–9	10–14	15–19	20–24
< 20	Birth Int (mths)(1)	20.4	19.9	29.1	26.5	42.9
	Est FMFR (2)	588.2	603.0	412.4	452.8	279.7
	DSFMFR (3)	400.0	600.0	400.0	400.0	200.0
	(2)/(3)	1.47	1.01	1.03	1.13	1.40
20–24	Birth Int (mths)(1)	18.2	22.3	30.6	29.4	28.9
	Est FMFR (2)	659.3	538.1	392.2	408.2	415.2
	DSFMFR (3)	563.6	454.5	355.6	320.0	200.0
	(2)/(3)	1.17	1.18	1.10	1.28	2.08
25–29	Birth Int (mths)(1)	19.3	25.7	23.2	26.0	
	Est FMFR (2)	621.8	466.9	517.2	461.5	
	DSFMFR (3)	485.7	428.6	440.0	200.0	
	(2)/(3)	1.28	1.09	1.18	2.31	
30–34	Birth Int (mths)(1)	23.8	25.5	28.5		
	Est FMFR (2)	504.2	470.6	421.1		
	DSFMFR (3)	400.0	433.3	320.0		
	(2)/(3)	1.26	1.09	1.32		

		Duration of marriage (years) 1800–49				
Wife's age at marriage		0–4	5–9	10–14	15–19	20–24
20–24	Birth Int (mths)(1)	19.3	23.6	27.4	42.4	
	Est FMFR (2)	621.8	508.5	438,0	283.0	
	DSFMFR (3)	514.3	433.3	360.0	200.0	
	(2)/(3)	1.21	1.17	1.22	1.42	
25–29	Birth Int (mths)(1)	21.2	21.8	29.4		
	Est FMFR (2)	566.0	550.5	408.2		
	DSFMFR (3)	466.7	500.0	200.0		
	(2)/(3)	1.21	1.10	2.04		
30–34	Birth Int (mths)(1)	16.5				
	Est FMFR (2)	727.3				
	DSFMFR (3)	200.0				
	(2)/(3)	3.63				

Key: Birth int. (mths) = average birth interval measured in months allocated to an age ranking according to the mid-point of the birth interval; Est FMFR = the estimated fecund fertility rate by using the average birth interval B = (1000/B) * 12; DSFMFR = duration specific fecundity marriage fertility index; ideally (2)/(3) should be one.

Before considering these results the limitations of this exercise need to be clearly stated, namely, that we are dealing with very small samples especially by comparison with those used by Wrigley et al., and we are relying on the veracity of assumptions adopted from Wrigley et al. and that they pertain to a pre-industrial population that did not consciously practice any form of birth management. The

argument here, then, is that if the Newgarden/Carlow population did use birth management practices the ratio of estimated FMFR to DSFMFR should not be equal to or close to one. In practice this is far from the case. Of 56 panels in the above table only 12 (21.0 %) have a ratio near enough to 1 (between 0.90 and 1.10). While this does not prove that birth management practices were deployed by the Newgarden/Carlow population it is another line of evidence that tends to support the contention. Moreover, since there is not one 'age at marriage' group in any of the TPs that appears to meet the criteria for 'natural' fertility one is tempted to conclude that birth management practices were utilized from time-to-time throughout all TPs.

It would also be prudent to round this exercise off by testing the veracity of the equation ASMFI (conventional) = (B_{leg}/Ex_{pf}) * Fec_{entry} * Fec_{sub} with these data (following Wrigley et al. 1997: 361). For this purpose data for the 20–24 year age rank, 1700–1749 TP has been chosen and the results tabulated in Table 19:

Table 19: Fecund marital fertility rates, subsequent fertility etc. for women married aged 20–24 by age of mother at birth of children for the 1700–1749 TP.

Wife's age at birth of child	Fecund marital fertility Rate (A)	Entry fecundity (B)	Subsequent fertility (C)	Overall fecundity (B) *(C) = (D)	Implied marital fertility rate (A) *(D) = (E)	Observed marital fertility rate (F)
20–24	288.9	1.0000	1.0000	1.0000	289	289
25–29	377.8	1.0000	0.9830	0.9820	371.0	378
30–34	425.0	1.0000	0.7705	0.7705	327.5	453
35–39	236.4	1.0000	0.4567	0.4771	108.0	236

In theory (E)/(F) should be one (1) and it can be seen that while there is a good correlation between the implied and observed marital fertility rates for the first rank, thereafter there is a wide divergence, not unexpected given the outcome of the previous exercise. These results are typical for other marriage ranks and TPs.

Identifying anomalies in the data is one thing but explaining how they arose is another. Ideally definitive tests would be available that could identify whether family management strategies were being deployed (e.g. spacing and stopping) but unfortunately there are none that can be successfully applied to these data.[9] There is evidence of variation in birth strategies, and of change. The causative factors have not been identified although a number of possibilities have been discussed in the foregoing and others are explored by Vann and Eversley. Basically no new evidence relating to cause and effect has emerged from the present study that can add to or mitigate their conclusions. In their view the most likely strategies deployed by couples to control or regulate births were abstinence from sexual intercourse and/or to prolong lactation by breast-feeding (thereby extending their periods of amenorrhea) or by terminating lactation and utilising wet nurses (thereby decreasing the period of amenorrhea).[10] It is true also that the increased fertility noted in both sets of data for the 1750–1799 TP could have been influenced by a reduction in infant and/or prenatal mortality, if such could be

documented. If, for example, there had been significant under registration or incidences of miscarriages before this period, say as a result of periodic outbreaks of small pox,[11] but that as a result of the inoculation programs in the area during the second half of the eighteenth century the threat was reduced, then there is at least one explanation for an increase in the rates of infant survival subsequently. Frankly there is little supporting evidence for such a thesis. That there was a fairly comprehensive inoculation program supported by the gentry of the Carlow district c. 1769 is established, but little is known about the incidence of small pox and its affect on childbirth and mortality during the preceding century.[12] And of course there is no reliable measure of the incidence of under-registration for any of the TPs. Essentially, then, one is left with the explanation that birth regulation, when it was entertained, was either an idiosyncratic gesture and/or a cultural phenomenon. Nor was the idea of birth limitation new: as discussed above there is evidence that it was being practiced by American Quakers from the middle of the eighteenth century.

MORTALITY

When Friends died they were usually buried within two days of death at the nearest Quaker burial ground or at the burial grounds that had been used by their families in the past. Each Meeting tended to have its own burial place: for the Carlow and Newgarden Meetings they were located at Newgarden and Ballykeally, for Kilconner Meeting at Ballybrommell and for Ballytore Meeting at Ballytore. Ostentatious displays of grief and mourning were discouraged and the dead were buried with little ceremony, usually in unmarked graves (Greaves 1998: 213). Descriptions of Quaker funerals are rare, but William Savery (Savery and Evans 1844: 273-74), travelling in the Waterford-Clonmel district during 1798, witnessed the burial of a daughter of Elizabeth Usher who had died of consumption. He was clearly moved by the spectacle:

> Her corpse was carried to the Meeting-house, but not brought in where the meeting was held, but left in the women's meeting-room, which is their custom; for as they are surrounded by Roman Catholics, they might take up the opinion that Friends brought the corpse into the meeting, with the idea that it would be profitable to the departed spirit to pray over it. Through the renewed mercy of our heavenly Father, it was a precious parting meeting; many of the youth were much affected, as also others.
>
> The corpse being put in a plain oak coffin, and placed upon a hearse, was led slowly through the streets to the burying-ground; friends, relations, &c., following promiscuously:—all business seemed to cease as we passed along, and much stillness appeared among the people, many of whom new [*sic*] the family, they being of high rank; the grandfather who lay a corpse, was the alderman of the city. At the grave-yard, a multitude were collected, both Friends and others, high and low; and I believed it my duty to say a few words, and rehearse the comforting expressions of the deceased; after which there was a farther communication from another Friend, and many not of our society were much broken.

Care was taken, however, in comforting dying Friends and special notice was taken of their last words and wishes. Worthy Friends sometimes had gracious words said about them by speakers at Meetings after their deaths. These took the form of testimonies that were recorded, many of which have survived to this day.

In this section three aspects of mortality will be examined: average age at death, infant mortality and age specific mortality.

The 'average age of death' for males and females by TP are summarised in Table 20 and except for a slight retraction in the 1750–1799 TP there is an upward trend from 1650–1699. It must be acknowledged that the actual 'mean age at death' will be higher as the population from which the averages were calculated is biased towards younger persons. Nevertheless, if one makes the assumption that there is a similar bias in all TPs, comparisons between TPs can be made and the trends are likely to be reliable. The bias is illustrated in the tables below which examine the way age data are distributed between the TPs. Table 21 compares the percentage number of individuals (males and females inclusive) for which ages can be calculated using absolute birth and death dates over 30 years of age at death and less than 10 years age at death. The strong and consistent bias towards the younger group is readily apparent in most TPs. Table 22 shows the same comparison for persons where year of death only is known. This time the opposite trend is apparent. Thus by including year only data in the estimates of average age at death the bias in the estimates using absolute birth and death dates is partially redressed.

Table 20: Average age at death (biased sample—see text), and life expectancy★ at birth extracted from Vann and Eversley (1992: 228, Table 5.10). Sample numbers in brackets.

TP	Av. age at death male	Av. age at death female	Estimated life expectancy at birth—Male★	Estimated life expectancy at birth—Female★
1600–49	54.23 (14)	71.66 (6)		
1650–99	36.55 (169)	36.27 (112)	47.0	50.0
1700–49	40.16 (294)	36.08 (223)	41.3	45.8
1750–99	36.83 (231)	38.70 (206)	44.1	47.9
1800–49	45.47 (186)	49.73 (139)	58.3	59.4
1850–99	57.53 (93)	59.82 (72)		
1900–49	61.29(37)	59.62 (29)		

Table 21: Age at death: % no of persons in each TP, complete dates of birth and death only.

Age TP	Persons over 30 years at death (%)	Persons under 10 years at death (%)	Sample number
1600–49	83	17	6
1650–99	47	37	205
1700–49	48	39	403
1750–99	47	39	352
1800–49	54	30	199
1850–99	84	9	125
1900–50	78	17	46

Table 22: Age at death: % no of persons in each TP, year only dates of death, date of birth year only, or complete.

Age TP	Persons over 30 years at death (%)	Persons under 10 years at death (%)	Sample number (year only for date of death)
1600–49	80		5
1650–99	52	32	44
1700–49	84	8	59
1750–99	84	6	51
1800–49	86	3	97
1850–99	87	9	47
1900–50	94		17

Vann and Eversley (1992: 227ff.) discuss and use life tables to estimate the mortality of Irish and English Quakers, which should give a much more accurate idea of life expectancy. While the two data sets are not strictly comparable, it is notable that both data sets show similar trends. The figures in the life table show a distinct upward trend in life expectancy for both males and females, with females living longer in all TPs. The averages derived from the Newgarden/Carlow data show similar trends except for the 1650–1750 TPs where the average age at death of females is less than their male counterparts and the average age of death of males in the 1700–1750 TP is somewhat higher than for the subsequent TP. Why this should be so remains to be discovered (unless it can be attributed to sampling error). In both data sets the increase in life expectancy from the 2nd to the 5th TP is substantial for both males and females (9 [M] and 13 [F] years for the Newgarden data and 11 [M] and 9 [F] from the life expectancy estimates).

Tables 23-24 summarise the results of an age specific mortality analysis for males and females, though the results are limited because of poor sample numbers, particularly for females, in many age-group categories.[13] Nevertheless the results indicate that mortality rates for males were comparatively high for children in the 0–0.99 year TP for all TPs from 1650 onwards. Mortality rates begin to rise again once the 45–50 year TP is reached. What seems to be happening is that as we move towards the present there is a perceived reduction in mortality rates in later TPs and higher mortality rates drift towards the over 60s. There is a possible 'bump', however, in the 1750–1849 TPs for males in the 20-29.99 year rank. Infant mortality rates climb to a peak in the 1750–1799 TP and then decline.

Table 23: Age specific mortality rates for descendants of the Newgarden Meeting—Males (no. of years in observation in brackets).

TP Years	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
0–0.99	0(14)	155(168)	164(293)	177(231)	86(186)	27(112)
1.00–4.99	19(54)	46(548)	34(935)	41(734)	26(660)	12(426)
5.00–9.99	0(65)	3(585)	8(1057)	9(800)	10(765)	2(520)
10.00–14.99	0(65)	9(575)	11(1025)	8(765)	6(721)	4(515)
15.00–19.99	0(65)	9(550)	5(970)	8(735)	7(705)	2(505)
20.00–24.99	0(65)	15(525)	10(945)	18(705)	9(680)	5(500)
25.00–29.99	0(65)	19(485)	6(900)	17(640)	9(650)	4(490)
30.00–34.99	0(65)	7(440)	7(875)	12(585)	16(620)	21(480)
35.00–39.99	0(65)	9(425)	13(845)	9(550)	14(570)	7(430)
40.00–44.99	31(65)	20(405)	14(790)	6(525)	8(530)	12(415)
45.00–49.99	36(55)	25(365)	11(735)	18(510)	14(510)	18(390)
50.00–54.99	22(45)	25(320)	30(695)	13(465)	27(475)	11(355)
55.00–59.99	50(40)	25(280)	15(590)	28(435)	15(410)	9(335)
60.00–64.99	67(30)	29(245)	39(545)	13(375)	11(380)	22(320)
>65.00	172(23)	75(576)	77(1148)	78(902)	74(979)	64(892)

Table 24: Age specific mortality rates for descendants of the Newgarden Meeting—Females (no. of years in observation in brackets).

TP Years	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
0–0.99	0(6)	124(113)	148(223)	97(207)	79(139)	42(71)
1.00–4.99	0(24)	38(373)	49(730)	53(701)	18(504)	11(267)
5.00–9.99	0(30)	9(425)	17(770)	11(750)	3(595)	0(325)
10.00–14.99	0(30)	10(405)	16(697)	8(710)	7(581)	3(325)
15.00–19.99	0(30)	16(385)	12(650)	7(680)	14(565)	3(320)
20.00–24.99	33(25)	17(355)	5(610)	14(656)	11(525)	3(320)
25.00–29.99	0(25)	18(325)	10(595)	10(610)	6(495)	10(310)
30.00–34.99	0(25)	20(293)	5(565)	19(580)	17(480)	10(295)
35.00–39.99	0(25)	30(265)	13(550)	4(525)	9(440)	4(280)
40.00–44.99	0(25)	13(225)	12(515)	14(515)	5(420)	7(275)
45.00–49.99	0(25)	14(210)	19(485)	19(480)	15(410)	19(265)
50.00–54.99	40(25)	26(195)	20(440)	7(435)	5(380)	8(240)
55.00–59.99	0(20)	18(170)	15(390)	31(420)	11(365)	30(230)
60.00–64.99	0(20)	19(155)	33(360)	34(355)	14(345)	21(195)
>65.00	39(102)	65(429)	68(900)	76(780)	68(956)	48(749)

The figures for females start with highest mortality rates in the 0–1 year old range followed by a similar pattern of mortality to that of males with a drift towards lower mortality rates from the 1700–1749 TP in a number of age ranks. Mortality doesn't start to change significantly until the 45–49.99 year rank is reached. Slight peaks are apparent in the 30–35.99 year rank for the two TPs 1700–1799. However, given the poor sample numbers it is difficult to know whether these anomalies have a tangible cause and require an explanation. Infant mortality rates peak in the 1700–1749 TP and decline thereafter. In general female mortality

rates are less in the infant category than their male counterparts but thereafter are slightly higher in many ranks until the 45–49.99 age rank is reached.

On the basis of these figures it would appear, then, that females had a higher infant mortality rate than men and that they probably survived better than their male counterparts once they reached 45 years. The differences between male and female mortality rates are no doubt attributable to the fact that married women were at a much greater risk of maternal mortality during their fecund periods (Wrigley et al. 1997: 308). Looking across the top line of the tables, sparse though the samples are, there appears to be a decline in infant mortality for both males and females during the last two TPs.

There is no evidence from the data in Tables 23-24 that the great famine (1846–1851) adversely affected the Newgarden/Carlow population. There is a jump in the ASMR for 50–54.99 year old males (13 to 27) in the 1800–1849 TP which is not sustained into the next TP (drops to 11) but taken alone it can hardly be used to support an argument for an impacted population. Moreover, the average ASMR rates for both males and females are well below the estimated value of 22/1000 for the general population of Ireland at around the outbreak of the Famine aside from the even larger estimates for the period during the famine (Cousens 1960: 62).

Mortality data have been rearranged in Table 25 to show age specific mortality as a function of the mother's age at marriage. Sample numbers are relatively small because accurate dates of birth and death were a prerequisite for inclusion in the analysis as well as the mother's date of marriage.

Some trends are notable. The index falls away through the TPs for all marriage ranks except for slight increases for women who married under the age of 24 in the 1750–1799 TP. Again there tends to be an increase in the index with age at marriage. The quite sharp increase in the index for the 30–34 year rank would suggest that there was a much greater risk of infant mortality for woman who married and started families in this and presumably subsequent marriage ranks. Infant mortality appears to have been more of a problem during the 1650–1699 TP as the ratios tend to be higher than those for the marriage ranks of subsequent TPs.

Table 25: Infant mortality ratios for descendants of the Newgarden Meeting by age of mother at marriage. Accumulated periods of observation for children whose dates of birth and death are known in brackets.

Age at marriage (years)	1600–49	1650–99	1700–49	1750–99	1800–49	1850–1900
< 20	0.0(3)	370.4(41)	119.3(59)	150.9(27)	0.0(6)	
20–24	0.0(3)	334.8(93)	100.8(119)	153.6(52)	77.4(52)	123.5(8)
25–29	0.0(10)	188.7(32)	209.1(53)	179.2(28)	109.9(9)	0.0 (22)
30–34		645.2(9)	593.2(12)	330.0(30)	0.0(6)	0.0(2)
35–39			270.3(4)			0.0(2)
Totals	0.0(16)	333.0(174)	154.5(246)	197.4(137)	68.7(73)	29.3(34)

Turning now to a comparison of these results with those obtained by Vann and Eversley (1992: 193, Table 5.1a) for the NDB. Notably their infant and child mortality rates are lower than those obtained for the Newgarden/Carlow data and the downward trend from the 1650–1699 TP is not as strong. However the basic behavior of the ratio is the same, though with a significant rise in the 1700–1749 TP. One major difference is in the mortality rates for children aged 1–4.99 which are sometimes about the same as or even higher than those for infants whereas the opposite is the case for the Newgarden/Carlow data. The differences between the magnitudes of the ratios for the two data sets can probably be attributed in part to the imperfections of the sample used, but there is no reason to think there has been significant under registration of deaths in the 1–4.99 year old range or that this particular rank is not well represented in the sample.[14] If indeed the mortality rates for children in the 1–4.99 year old range as portrayed in the tables above are indicative of a real trend, then they suggest that by comparison with NDB, the Newgarden/Carlow population that fell into this age range had a much better chance of survival. The consistency of the indexes relative to those of the 0–0.99 year rank is enough to suggest there is merit in this hypothesis. The ratios tend to be lower for females than for males in both data sets. Unfortunately the death registers do not give the causes of death, but given the relatively young ages at which many Friends died (by today's standards) it can probably be assumed that most did not die of 'old age'. There are occasional descriptions of the passage of illness and death in the various testimonies but they rarely give any clue as to the cause of death. The one for John Watson who died in 1710 is typical:

> About the 12th day of the 10th month 1709, he was taken unwell in the time of the Province meeting at Castledermot, and after going home grew weaker in body, in [indecipherable] so about three months [indecipherable] in which time he was often exercised in fervent prayer to god, with thanksgiving and praise to his holy name for his mercies and favors towards him, and being resigned to his holy will in life or death, saying: 'If the lord has not a further service for me I am willing to die, I bless god, I have a peaceable conscience, my good God hath all along been my strength, my stay, my song and salvation' (SOFHL Ms Grubb Collection).

One can only speculate about the diseases and ailments that beset the Newgarden/Carlow Quakers and brought about their demise. There are few Friends' records that detail how individual members of the Meeting died or for that matter how anybody living in the region died. Indeed, there are few reliable statistics about the effect of disease on the Irish population until the nineteenth century. For the earlier period anecdotal information is about all that is available.

Some women almost certainly died in childbirth or shortly afterwards. The data presented below (Tables 26-27) show the percentage numbers of mothers that died within 2 and 5 years of marriage and the percentages that died within a year and 30 days of the birth of their last child, first marriages only. These calculations could only be performed where appropriate data were available and consequently the results as such are a sample of a sample. However, as the estimated sampling levels are relatively high (generally greater than 20%) the results are likely to reflect the mortality rates for the whole population.

Table 26: Proportion of mothers who died within 2 and 5 years of marriage.

	1600–49	1650–99	1700–49	1750–99	1800–49	1850–99
Within 5 years of marriage %	0.0	9.4	5.9	8.1	6.5	6.5
Within 2 years of marriage %	0.0	4.7	3.0	2.7	2.6	3.2
Total no. of marriages for which data are available	8	85	135	74	77	62
Est. % sampling level	20	35	35	32	36	34
Total no. 1st M Female	41	245	391	229	212	185

Table 27: Proportion of mothers who died within 1 and 12 months after giving birth to their last child compared with the proportion of married males who died within 1 and 12 months of the birth of their last child.

For females	1600–49	1650–99	1700–49	1750–99	1800–49	1850–99
Within 12 months of last child born %	6.7	15.4	7.4	8.3	10.0	6.5
Within 1 month of last child born %	0.0	6.2	2.5	2.1	2.5	0.0
Total no. of marriages for which data are available	15	65	81	48	40	31
Est. % sampling level	37	27	21	21	19	17
Total no. 1st M Female	41	245	391	229	212	185

For males	1600–49	1650–99	1700–49	1750–99	1800–49	1850–99
Within 12 months of last child born %		12.5	15.6	3.5	6.3	5.3
Within 1 month of last child born %		6.3	8.9	3.5	2.1	5.3
Total no of marriages for which data are available	21	80	90	57	48	38
Est. % sampling level	45	31	23	28	24	21
Total no. 1st M Male	47	257	389	203	199	181

The percentages are not that significant viewed in the context of the total numbers of married women and initially one may be tempted to accept these results as a quantitative indication of the level of mortality associated with bearing children. If this was the case then one would expect to see much lower mortality rates for husbands compared with wives for the periods immediately following last births. The average % mortality for husbands during the 12 months and 30 days after the birth of last child are shown in Table 27 and taken at face value, these

data do not support the forgoing hypothesis. Indeed, they suggest that child bearing may not have been a major factor in influencing female mortality in the periods following last birth.

Violent deaths through duels and uniformed service can be ruled out because members of the population in all but the last two TPs avoided confrontation and occupations that may have involved violence. As the Society dissipated and Friends left to enter mainstream society, several did join the uniformed services but in general this did not happen until the nineteenth century and even then few took that road. Death through starvation and/or malnutrition is most unlikely as there is absolutely no documentary evidence that any Friends anywhere in Ireland were ever in such dire straits. Basically if any families were in trouble they were taken care of by the Meeting while they remained in unity.[15]

However, if starvation or malnutrition and/or disease were associated with the onset of hard times and contributed to the mortality of Friends then one would expect the number of deaths to increase during or just after such events. This possibility is examined in Figure 7 which shows the % number of deaths per year calculated by using the total numbers of deaths that took place in the 10 years forward from the year in question as the denominator. If y_1 = year in question and N_{y1} = no. of deaths in that year, then the percentage is calculated as follows:

$$\text{Percentile} = (N_{y1} \star 100)/\sum N_{y1} \text{ to } N_{y10}$$

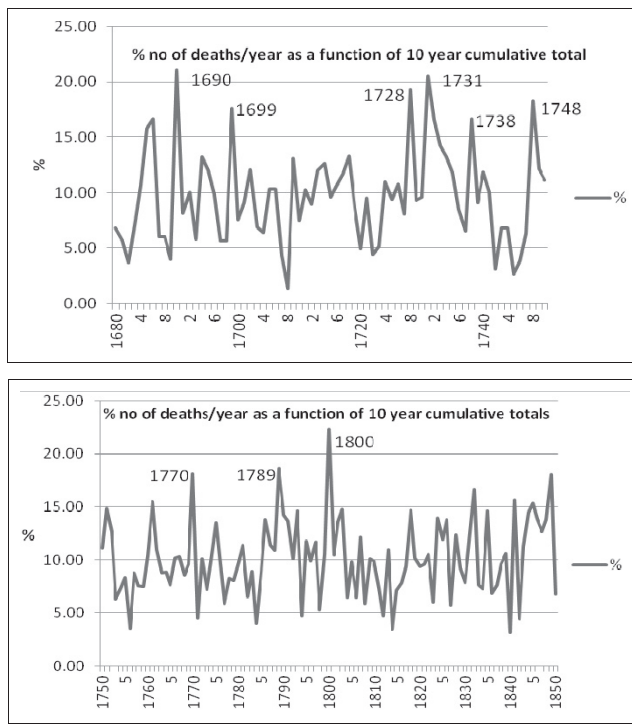

Figure 7: Correlation between death rate and catastrophic events.

While the percentiles are fairly scattered and there are many peaks and troughs, some of the most prominent peaks coincide with catastrophic political and economic-related events. These included the Williamite war (c. 1690), famine in 1727/8, the great frosts of 1799/1800 and the aftermath of the rebellion in 1798, and there is a sustained build-up in the percentages from 1845 to 1850 after and during the great famine. That is not to imply that starvation or malnutrition played any role in increasing the number of persons dying in those years; it is more likely that it was the incidence and spread of disease initiated by these events that influenced the death rate among Friends. Notably there are a number of other peaks in the graph that do not coincide with catastrophic events. Thus if one accepts that there is a correlation between some of the peaks and catastrophic events then one must also assume that their uncorrelated counterparts are not random aberrations but were produced by some as yet unidentified catastrophic events. An age analysis of the persons who contributed to the various peaks indicated that one third to one half of the individuals that died were infants or children, so that no matter what caused their deaths during those periods it cannot be said that there was a strong bias towards children.

Another possibility, already alluded to above, is that epidemics impacted on mortality, caused by diseases and conditions such as small pox, measles, scarlet fever, typhus, whooping cough, diphtheria and pyrexia. Of these, small pox was the most destructive during the eighteenth century (Kelly 1999: 30). Aside from the very serious epidemic that broke out in 1741, the persistence and the impact of small pox on regional populations is not well documented for the eighteenth century.[16] The Quaker population of the Newgarden/Carlow Meeting may not have escaped the impact of this epidemic, since an entry in the minutes of the Men's Monthly Meeting (26 April 1741) makes reference to 'this sickly time' and there are several instances where members of the Meeting had to defer allocated tasks because of sickness in their families.[17] The odd reference in the literature to small pox or what could be construed to be small pox suggests that it was an ongoing problem from the late seventeenth century. Thus Elizabeth Watson, daughter of John Watson and Anne Tomlinson of Kilconner, was 31 years old when she died at the house of William Gray of Ballyhagen, County Armagh in 1712.[18] According to Leadbeater (1823: 128) she died of small pox while visiting him with a female friend. Leadbeater describes how her father went to find her, but returned home with her horse and with her clothes tied on the side-saddle. The mother took the news in her stride consoling herself with the words, 'I have had ten children, and not a bad one!' (1823: 128). Watson also lost his eldest son to disease in 1709, possibly killed by small pox or consumption. He had left 'his sickly son' in Cork 'under cure' during one of his periodic visits but to no avail.[19] Small pox also claimed the life of Susannah Nicholson in 1726, wife of Samuel Watson who was John Watson's nephew (Edwards 2000: 2). The children of Samuel White,[20] William Malone[21] and three of his children all contracted small pox around that time, one of whom was not expected to survive. The disease, however, was not always fatal as all of White's children survived. Small pox appears to have continued to take its toll throughout the eighteenth century, even

after the introduction of inoculation into County Carlow in 1769, because many persons did not participate in the program and remained vulnerable. Job Scott, a visiting minister, contracted small pox from the daughter of Robert Clibborn in Dublin in 1793 and was taken ill while visiting at Ballytore in County Kildare, dying after 13 days (Leadbeater 1862: 198). As the disease progressed he documented his experience (Scott 1798: 362):

> The eruption began yesterday, and is very greatly increased to-day. I am very agreeably attended by physicians and the kindest of friends.—My distress of body, through extreme difficulty of breathing, &c. has, for a short space of time, been almost equal to any thing I can suppose human nature capable of, but (it is now half past nine at night) this has been a very comfortable day…

Leadbeater also makes reference to several other persons that died from the disease in the late eighteenth century, including Betsy Shackleton, a child, in 1784 (Leadbeater and Shackleton 1814: 156), Julia Jackson, a young woman, in 1776 (1814: 33), the first child of Richard and Elizabeth Shackleton c. 1757 (Leadbeater 1822: 30) and Joseph Poole, son of Joseph and Sarah Poole, in 1785 (1822: 136). The children of Abraham Shackleton all contracted the disease in 1788 but seem to have recovered satisfactorily (1822: 157).

Fever, a vague term used to describe a variety of febrile illnesses, including pneumonia, typhus, typhoid and pleurisy, was well known in Ireland, and in the nineteenth century it was referred to locally as 'Irish ague' (Crawford 1999: 122). However, typhus was the most feared and deadly of these diseases, especially during the eighteenth century. The disease flared up several times during that period culminating in a major outbreak in 1799–1801, and there were four well-documented epidemics during the nineteenth century (1999: 121).[22] It was transmitted by lice (although no one really knew this until 1909) and was particularly rampant among the poor. The disease did not discriminate between sexes, young or old, rich or poor (1999: 124) and it is not surprising in the absence of effective treatments that the public was frightened and often acted irrationally when the disease flared up.

One would have thought that Irish Friends were perhaps better placed to avoid contracting the disease than their counterparts in the worldly community because of their clannish lifestyle and because of their generally middle-class status which allowed them wear clean clothes and have an occasional wash. However, many members travelled regularly, bringing them into contact with other communities, and their concern for the poor, whether members of the Society or not, may have exposed them to carriers of the disease. Attendance at markets, public meetings, even their own Meetings also created opportunities for disease to prosper. While there are no descriptions of how this disease or 'fevers' per se affected the Newgarden/Carlow population in general there is evidence that they were affected and that some members died as a result of contracting fevers. For example, Jonathon Haughton succumbed in 1785 when 'He took ill of a low fever, and the symptoms soon became alarming' (Leadbeater and Shackleton 1814: 157). Leadbeater described the incidence of a fever striking Ballytore during the autumn

of 1817 which killed one of the local girls (Leadbeater 1862: 362, 364). Her own father died of a 'putrid fever' in 1792 (1862: 197)[23] and in 1798 her husband was struck down by a 'dangerous fever' from which he eventually recovered. She mentions several other instances where fever[24] resulted in the deaths of individuals (1862: 165, 188, 190, 197, 222, 267, 289 and 290) but symptoms are not described. From her accounts it appears fevers were prevalent among the poor around Ballytore during the Summer periods and presumably this was typhus (1862: 253).

Consumption was another serious disease that is mentioned occasionally in Quaker books and journals and which took its toll on Friends. Consumption is the common name for tuberculosis, a highly contagious bacterial disease (Bates 1992: 7). The most common variety is pulmonary tuberculosis and it proved to be a leading cause of death. There are a number of documented cases in the eighteenth century where Newgarden/Carlow Friends died from the disease. For example, Elizabeth Haughton died of consumption in 1785 (Leadbeater 1862: 158) as did Aldborough Wrightson in 1772 (1862: 93), a young widow in 1789 (1862: 177), Joseph Barrington in 1797 (1862: 276); William Savery also mentions the loss of two daughters and a son of Elizabeth Usher[25] to consumption c. 1798 (Savery and Evans 1844: 270). The disease became an endemic problem in the nineteenth century (Jones 1999: 158) when it affected a significant proportion of the population, providing impetus for the medical profession to put effort and resources into finding more effective methods of treating it (1999: 159).

Of the other epidemic diseases and their effect on the Newgarden/Carlow population nothing is known. Vann and Eversley (1992: 223ff.) have plotted the seasonality of deaths from documented causes with the objective of identifying patterns that could help in determining causes of death where it is unknown. For example, their data indicate that gastrointestinal disease was more prevalent during September, fevers tended to peak in April and consumption in June. When the Newgarden/Carlow mortality data are analyzed by season the results show no sharp seasonal trends in any of the TPs and monthly ranks. Percentages range between 5 and 12 with the majority in the 9-10 range, which means that in this case the data provided by Vann and Eversley cannot be used as a vehicle for identifying probable cause of death.

Aside from the diseases themselves, there are several other factors that may have affected mortality: the quality of nursing and medical care, access to nursing and medical personnel, geographic isolation, climatic conditions, diet, conservatism and adherence to local superstitions and folk law, to name just a few. In respect of the last item it is important to remember that the Newgarden/Carlow population sample was drawn from an inland rural district of Ireland, where one would expect to encounter extreme conservatism in all aspects of daily life and an adherence to age old traditions, especially during the seventeenth century and first half of the eighteenth century. Self-diagnosis, recourse to prayer, utilisation of home remedies and recipes for treatment of disease, even magic, was the norm rather than the exception during those periods (Kelly 1999: 35).

Access to medical assistance and skilled midwives was limited, and in any case, there was no tradition, as there is today, for the sick or pregnant females to visit a physician or surgeon (if they could afford it) except in extreme circumstances. Indeed surgeons and barbers were one and the same, many with sullied reputations. Carlow was one of the more fortunate country towns: it had two surgeons, two MDs and an apothecary in residence in 1788 (Lucus 1788: vol. II). By 1824 there were four apothecaries, four physicians and two surgeons, plus a dispensary and fever hospital (Pigot and Co. 1824).

Nor were there local hospitals. Physicians were reluctant to take on pregnant women; indeed in 1736 the College of Physicians issued a directive to its members to abandon that area of practice to midwives (Kelly 1999: 28). Yet midwives, when they were available, were not trained and were usually recruited locally, their only qualification being that they had themselves survived childbirth. Children were born at home, the wife 'lying in' and assisted by a midwife. It is not hard to imagine that when a birth progressed and there were complications, an untrained midwife would be of little use. The distraught husband would probably have rushed out into the night, ordering his servants to saddle his horse and run to the neighbors for help. Off he would gallop to the nearest town seeking the professional services of a physician (if there was one resident) returning hours later to find his wife and child had not survived the ordeal. But even worse, on reaching the town he may have had no option but to seek the help of an apothecary whose dubious medical knowledge and suspicious concoctions, if deployed, may have hastened the demise of his ailing wife.

According to Kelly, many rural areas of Ireland had no physicians or surgeons so that residents had little choice but to rely on their local apothecaries for medical advice. It seems, however, they were not held in great esteem as he suggests that the sick had more faith in farriers than in apothecaries (Kelly 1999: 32). Assuming that our heroic husband did manage to find a doctor and return home there was no guarantee that the doctor could have done anything useful. Treatments were primitive, as was medical knowledge, and consequently outcomes were often disappointing. Physicians in general did not enjoy the kind of God-like aura that they enjoy today.

Some indication of the primitive nature of Irish medicine as practiced in rural areas of Ireland in the mid-eighteenth century, if not before, can be gleaned from the account of John Churchman's (1779) illness. Churchman, a Quaker minister, had been travelling through the rural area in 1752, sleeping 'rough' sometimes in cold damp quarters (1779: 120). By the time he reached Moate Granoge in County Westmeath he had gone down with fever that had developed during the previous week. The day after his arrival his illness 'became very violent'. Alarmed, his hosts sent for an apothecary who treated him by blood letting his arm. The intervention appeared to give him some immediate relief and he subsequently fell asleep. However, the flow of blood could not be controlled. He woke up about midnight feeling very weak, sweating profusely and was sick (presumably vomiting). His wound had opened and it had not been properly bound. It was

Churchman who initiated the next intervention, despite the presence of the apothecary who had been pressed by Churchman's hosts to stay the night. Churchman directed the apothecary to 'peel a bladder and apply a thin piece of it about as broad as a half penny on the wound' (1779: 121). He was told to hold the dressing over the wound until 'the plaster dried or stuck' and the blood flow was stilled. The treatment was successful; the apothecary was duly impressed commenting that 'he had not seen the like' before. But there was more to come.

The following morning the local (qualified) physician was called in. The physician felt his pulse and when Churchman asked for a prognosis he was given no reply. Churchman, however, was persistent: 'Be not afraid to tell me, for I am not afraid to hear', he told the physician. 'That is happy for you', replied the latter, leading Churchman to think he would not recover. After examining his spittle, the physician offered a diagnosis and remedy: severe consumption the diagnosis and 'taking a vomit' the remedy. Churchman, however, argued that since the physician reckoned that his lungs were inflamed a better remedy would be a moderate purge. 'You are an odd patient', replied the physician, 'Come. You shall be the physician and I will be apothecary.' So it was that the physician supplied the purge and Churchman did recover, despite the pessimistic prognosis of his physician, who had visited him daily for a week following his initial intervention (1779: 122).

There were, of course, publications that recommended remedies for sickness and procedures for the care of pregnant women and their off-spring. Some of these were useful, some harmless, others potentially dangerous. As Vann and Eversley (1992: 198) point out, some of the infant nursing advice, if followed, may have contributed to infant mortality. For example, prior to 1747 the practice of delaying breastfeeding was common even though this denied infants the benefits of colostrums which contain antibodies that give them some immunity to disease.

Vann and Eversley (1992) were fortunate in having access to some data relating to causes of death for infants, children and adults, but only for London Quakers and even then the data proved difficult to interpret because of omissions, confused nomenclature and incomplete and ambiguous descriptions. Obviously their data and conclusions cannot be used to explain the mortality of the Newgarden/Carlow population as the environmental and socio-economic circumstances of the two populations are quite different. However, Vann and Eversley (1992: 212ff.) found that although Friends who belonged to the London community died from a wide range of causes, a few predominated, including fevers, pulmonary ailments, smallpox and gastrointestinal ailments, the frequency and intensity of which could and did change over time. This was probably the case in Ireland, but the way they interacted with the local communities may have been different. Certainly there is evidence that the same killer diseases were present in Ireland and that at times they were much more lethal than in England.

The Newgarden/Carlow population began as a rural one but as each successive generation produced children and they dispersed into the wider community many moved to urban areas. Vann and Eversley have clearly shown in their analysis of

urban communities that mortality rates were much higher there than for non-urban areas. This is not unexpected given that the risk of disease is greatly enhanced when people live and work in close proximity, in environments where water can be contaminated and rubbish accumulates. Given that the Newgarden/Carlow population starts off as rural and ends up a mixture of rural and urban (although still largely the former c. 1900) one would expect its mortality rates to be lower than for urban areas and lower than those for the aggregated population of Irish Friends, which is a mixture of urban and rural populations. As a test of this hypothesis, Table 28 summarises child mortality rates for the NDB, the Newgarden/Carlow population and the English urban population (extracted from Vann and Eversley 1992: 206, Table 5.1b). It can be seen that the data tend to support this idea, although one would also expect some tendency towards convergence of the NDB and Newgarden/Carlow rates in the last TP.

Table 28: Child mortality rates for children (1–4.99 years).

TP	Irish population*	Urban population (England)*	Newgarden/Carlow Population
1650–99	105	212	46
1700–49	159	253	34
1750–99	137	146	41
1800–49	59	75	20

Key: *data from Vann and Eversley 1992.

It was suggested in the foregoing that there may be a relationship between wealth and mortality (Vann and Eversley 1992: 202) and more specifically that infants and children from families of superior socio-economic status had a better chance of survival. Few people would argue with such a proposition. Persons with money or goods to trade could buy or barter for food, fuel, clothing and shelter and consequently should have been well placed to provide safer environments for themselves and their children than those of lesser means. In theory they would have been better equipped physically and mentally to ward off disease and able to pay for advice and treatments when they were stricken. The claim is often made that Friends were 'middle class' and certainly towards the end of the eighteenth century 'wealthy and successful traders' (Grubb 1927: 95). If so, according to the foregoing hypothesis, they enjoyed an advantage over the majority of the Irish population and should have, in general, had a lower infant mortality rate and lived longer on average. But what evidence is there to support the idea that the Newgarden/Carlow population was middle class?

There are five main sources of evidence for socio-economic status of members and descendants of the Newgarden/Carlow Meeting: the minutes of the Meeting, wills and marriage agreements, land memorials, digests of sufferings and occupations where they are known. Whenever members got into financial trouble, or needed assistance, financial or otherwise, they were usually identified and mentioned in the minutes of the Meeting. The type of assistance varied. It could be given in the form of a grant, loans (these could be financial or animals such as a

cow for milk), advice or donations of materials to enable the person to pursue his trade. A small number of individuals were supported in such ways from time-to-time, particularly during and after periods of warfare. Moreover, the more affluent members acknowledged there was a poor element among their number as most left legacies for distribution to the 'poor'. However, judged on entries in the minutes there were few persons that fell into the 'poor' category.

Only a small number of wills and marriage agreements pertaining to members and descendants of the Meeting have survived. Précis of 23 relevant wills have been published by Eustace and Goodbody (1957), a small number were deposited in the Registry of Deeds, Dublin, some of which have been published (Eustace 1956: vol. I) and another dozen are in private hands, copies of which have been made available to the author by descendants of the Meeting.

Marriage settlements were quite common up until the end of the nineteenth century but were generally deployed only by families of substantial means. These were legal agreements made between members and /or representatives of the families of a bride and groom. The agreements usually defined the groom's estate, put it into trust, defined the bride's dowry and specified how it was to be disposed of, made provisions for the bride in the event of her husband's death and for any children that might result from the marriage. Such documents usually contain a wealth of information that can be used to ascertain socio-economic status. About thirty of these documents are available from the Registry of Deeds that relate directly to members and descendants of the Newgarden/Carlow Meeting.

The wills, almost without exception, were devised by Friends whose socio-economic circumstances ranged from what might be described as 'comfortable' to affluent, an assessment that can be made based on the amounts given away as legacies, the numbers and extents of their estates and their chattels. An example of a Friend in comfortable circumstances was George Baker of Athy, County Kildare a clothier who was able to leave bequests of more than £100 to his family (will dated 10 April 1733, Eustace and Goodbody 1957: 5). At the other extreme were the 'gentlemen farmers' like Robert Lecky who held leases of several estates containing hundreds of acres of land and was able to leave legacies in excess of £1000 (will dated 11 October 1707, 1957: 62). An exception is the will of John Mason who was only able to leave the sum of 12 pence to each of his children (will dated 22 September 1684, 1957: 68), presumably a man of very modest means.

Although there are few wills, they can effectively define or help to define the socio-economic circumstances of the recipients of legacies and in turn their descendants. When family reconstitution is applied to many of these families, by the time one reaches the twentieth century there are hundreds of descendants, many of whom have shared in, if not added to, the wealth of their forbears through inheritance and marriage. Reconstitutions of early Newgarden/Carlow families such as the Watsons, Russells, Leckys, Coopers and Boles are such examples, sometimes remaining in observation for more than 200 years. By using the odd will or marriage settlement, when they are available, one can check on the progress of such families and assess their socio-economic circumstances.[26] By and large the history of families of similar socio-economic status followed the same

trends. In the case of shopkeepers and merchants, businesses passed from father to eldest son, and the other males in the family were provisioned in other businesses. Socio-economically the status quo was maintained or there was growth. Farmers and gentleman farmers tended to pass their estates to their eldest son, but made provision for other sons, sometimes giving them lands or joint ownership in lands (moieties). This group maintained their social status but, as we have seen, often passed into debt after several generations and finished up losing their estates or going bankrupt. Daughters were married off to husbands who came from families of similar or superior socio-economic status. Although there is little evidence for Friends that engaged in trades, it is likely their children followed their father's trade and the status quo was maintained.

One of the most valuable sources of information pertaining to socio-economic status is land memorials. These are documents held by the Registrar of Deeds, Dublin, that detail land transactions between parties. They usually incorporate descriptions, the history and locations of the lands and financial details of the transactions. However, this type of document became available only after 1708 when the legislative framework for registering deeds was enacted (Ryan 1997: 10). Several hundred such documents relating directly to members and descendants of the Newgarden/Carlow Meeting have been analyzed. This part of the study, however, is ongoing, and so will not be reported upon here.

Another detailed and useful source of information about the socio-economic status of members is the catalogues of sufferings held at the Library of the Religious Society of Friends, Dublin. They comprise annual summaries of the farm produce, animals and goods and chattels belonging to members of the Meeting who refused to pay tithes and which were seconded by agents of the Church of Ireland and the courts.

And finally if one knows the occupation of an individual, it is possible to determine his most likely place in the socio-economic hierarchy. As discussed in Part 1 the occupations of many of the members are not known, though none seem to have fallen into the cottier or laboring categories.

When all the data available are qualitatively assessed one can conclude with some confidence that the socio-economic status of members and descendants of the Newgarden/Carlow Meeting rarely, if at all, fell below the bottom of the middle-class bracket, although some were close to it. The majority fell somewhere near the middle and a few climbed into the upper reaches of the middle class. Fewer still managed to cross the border between middle and upper class and join the lower rungs of upper-class society. Having said that, socio-economic status was not static for many individuals, and social mobility was a notable aspect of the Quaker community. Thus one can concede that most children born into Quaker families started with an economic advantage over their more worldly counterparts and they were backed up by a caring and concerned social network that was willing and ready to help in times of need (Grubb 1927: 97). The same network remained in place through child and adulthood ever vigilant to respond to those who required support.

SUMMARY AND CONCLUSION

This analysis has limitations and in particular it does not have the depth and scope of the Vann and Eversley study. This is partially because the aims of the study were limited to producing a simplified demographic profile for the population of the Newgarden/Carlow Meeting together with their descendants, for the purposes of comparing it with the one derived by Vann and Eversley for the wider population of Irish Friends, and for determining whether there was evidence for regional or local variation, and partially because of the limitations of the data themselves. Thus no attempt was made to calculate life expectancies as is done usually in traditional demographic analyses or to analyze infant mortality in depth. Again Vann and Eversley restricted their analysis to Quaker data extracted from their own birth, death and marriage registers, whereas the current study utilises data from several sources including persons who were initially Quakers plus their descendants who may or may not have been Friends. Indeed as one moves toward the late nineteenth and twentieth centuries the population sample is increasingly diluted with non-Friends. Again population dispersal may have impacted the results. The descendants of early Quaker families were not necessarily static, often moving to different areas of Ireland, and some ended up in other countries such as England, Australia, New Zealand and the USA. Thus it is not possible to claim that the population sample was drawn entirely from the Counties of Carlow, Kildare and Queen's County, particularly for the late nineteenth century, although many of its members continued to reside in rural areas of Ireland. The sample, then, has genetic as well as geographic biases.

Despite the foregoing shortcomings, the analysis does provide a broad but useful snapshot of the population of the Newgarden/Carlow Meeting and their descendants from around 1650 to 1900. As expected, most of the original members of the Meeting were a mixture of persons born in England but resident in Ireland plus a significant percentage of children of English parentage born in Ireland. Between 1650 and 1750 most of the membership was increasingly drawn from families resident and born in the Queens County, County Carlow and County Kildare. As the Meeting membership waned throughout the eighteenth century, as we have described, descendants of members dispersed. A few families, such as the Watsons, Leckys, Whittons, Coopers and Ducketts, remained in observation throughout the entire life of the Meeting, although shedding family members into the mainstream community in increasing numbers. By the end of the nineteenth century all that remained of the Meeting was their Meeting House in Carlow, the crumbling walls of an ancillary Meeting house at Kilconner, an overgrown and unkempt burial ground at Ballybrommell known as 'God's Acre' and dots on survey maps to indicate where the original burial grounds were located at Ballykeally and Newgarden.

The original Meeting was founded in a rural environment and most of its membership were engaged in some sort of farming activity, whether farmers by choice, or in some other occupation. The early membership was certainly not

made up of the rural poor or the semi-destitute. Many had leased estates ranging in size from a few acres to thousands of acres depending on their circumstances, grew crops, vegetables and fruits to satisfy their own needs and those of their families and their animals, and again depending on their circumstances, sold or traded what they did not use themselves. Despite the focus on rural activities a number of the early Friends had other occupations. There were carpenters, blacksmiths, weavers, traders, merchants and retailers to name but a few. However, there were also landlords, landed proprietors and several so-called 'gentlemen' farmers. Progressing from late seventeenth century into the following one there is evidence of social mobility and increasing wealth. Descendents moved into the trading and shipping towns of Waterford, Clonmel, Cork and Dublin and became merchants, shippers, even bankers as was the case with the Watson family, a branch of which had settled in County Tipperary from County Carlow and later founded a bank.[27] A member of the same family had moved to England where he built a series of theaters;[28] yet another member became a major in the Clonmel Independents.[29] Not everybody left the district, however. Many who stayed also prospered. Several expanded their landed interests, became landlords in their own rights, entered the ranks of the gentry, some becoming magistrates, participating in local politics and sporting activities such as hunting. The Watsons, Leckys, Coopers and Ducketts fall into this category. The nineteenth century saw even more diversity. Descendants entered the professions becoming lawyers,[30] doctors,[31] schoolteachers[32] and members of the clergy.[33] There were land agents, millers,[34] brewers,[35] investors, shopkeepers,[36] ship-builders,[37] magistrates and persons who performed public services,[38] to name but a few. Then there were those who migrated. One member of the Watson family migrated to Australia and became a famous racing identity, started the first hunting club in the country and operated a stage coach Company in Victoria.[39] His cousin also migrated in 1880 to become a pioneer in Gippsland, starting the first butter factory in the area.[40] Another member of the family became a famous polo player representing Ireland at international events.[41] Several descendants served in the military and/or militia,[42] and some were on active service in India and later South Africa.

Throughout the period 1650–1900 members and descendants of the Newgarden/Carlow Meeting tended to choose their marriage partners from the same county or from the surrounding counties and there was no preferred season of marriage though there was a slight shift away from marriages during Winter/Spring in the 1650s to Summer/Autumn in the nineteenth century. The average age at marriage for both males and females tended to increase from 1650 onwards. The average age of marriage for males in the 1650s was 27.7 and this had increased to 33.4 by the late nineteenth century. For females it increased from an average of 23.4 to 27.9 over the same period. Notably, the majority of grooms were older than brides by about 7 years and when brides were older the age difference tended to be smaller. Second marriages were quite common and the vast majority of these were between brides that were older than grooms, the difference ranging from 7.0 to 14.4 years.

Between 1650 and 1750 some 75% of men married under the age of 29 but thereafter there was a move towards delayed marriage as this percentage dropped to around 55%. During the same period around 28% of women married under the age of 20, but thereafter there is a strong tendency to delay marriage. The majority of brides continued to marry between the ages of 20–24 but from 1750 onwards a significant percentage married also in the 25–30 year age bracket. To give some idea of the difference, up to 1749 78–79% of the brides were under 24 years of age when they married, but by 1850 this figure had dropped to 62%. The sharpest drop, however, was in the period between 1750 and 1800 when just 54% married under 24 years of age.

As part of the search for an explanation for the increasing delays in marriage a hypothesis was raised and tested, namely that inheritance rules affected marriage customs. It was posited that children increasingly put off marriage until after their fathers died because of the need to be properly resourced before matrimony. In this respect the results of the analysis were not convincing; rather, they document a cultural practice wherein children tended to delay marriage until after the death of their fathers. However, if fathers were living longer than their predecessors, and as will be seen below they were, then by inference marriages of some of their children would also be delayed longer. The analysis also shows that this practice was much more in evidence for the periods 1750–1799 and 1850–1899 especially for eldest sons. This probably provides part of the explanation for a sharp drop in the proportion of men marrying under the age of 29 in the 1750–1799 TP.

Turning now to a consideration of birth patterns. The analysis revealed a clear tendency towards smaller family sizes from 1650 onwards. The average number of children per family for first marriages drops from 7.1 in the 1650–1699 to 2.7 in the 1850–1899 TPs. This implies that either there has been a marked reduction in fertility over this period or methods for limiting or controlling births were deployed. As one might expect the average number of live births tends to decrease with age of marriage, with the highest average occurring in the 1650–1699 TP for women that married under 20 years of age (average 8.3). The averages for the 1700–1749 TP are, however, quite notable as they remain fairly steady ranging between 6.1 and 6.6 live births for all marriages under 34 years of age. Generally speaking the highest averages over all TPs were for women who married in the 20–24 year range.

Consideration of the age specific fertility index by age of mother at birth of her children suggests the most fecund age range was for women in the 25–34 years old age rank for all TPs, although this spread to 39 years for the 1750–1799 TP. There is a sharp drop in the index (420 to 290) for women 30–34 years old at childbirth from the preceding TP, followed by a sharp rise (290-427), which may be an indication that a limitation strategy was being deployed. There are similar drops in ASMFIs for women giving birth aged 35–39 in the 1800–1900 TPs, which again suggests limitation strategies were used. When the age specific index is plotted against age of mother at marriage the index tends to peak in the age rank following the one for marriage. There are no sharp cut-offs in any of the graphs that would suggest deployment of stopping strategies. However, the steep

inclines from one age rank to the next apparent for some of the TPs are indicative of limitation during the course of the fecund periods. In cases where the age specific index flattens out between ages of mother at childbirth this in turn suggests birth spacing. Such is evident for women who married under 20 years of age in the 1650–1699 TP and for the women who married in the 25–29 age rank for the 1750–1799 TP. Notably the peak values tend to increase slightly with age at marriage, which would suggest that when women married later they got on with the job of having children. The behavior of the index for the 1750–1799 TP does not conform to this pattern. The peak values of the index instead tend to decrease, lending support to the idea that families may have used different birth management strategies from those deployed by them during the previous TP.

Analysis of the birth intervals also suggests that birth management strategies were deployed from time-to-time. There are indications, for example, that some women who married between 25–29 in the 1700–1749 TP delayed producing their first children. There is also evidence of spacing for women who married between 25–29 years in the 1650–1699 TP, 20–24 year range in the 1700–1749 TP, 30–34 year range in the next TP and women who married at any age in the TPs after 1800. When the birth intervals are averaged without regard to the age at marriage, the most notable feature is the schism in values pre- and post-1800 after which time there is unequivocal evidence that birth management was deployed.

In pursuing evidence for stopping strategies the age specific fertility index and the average age of mothers at last birth by age at marriage was examined. The results suggest that stopping strategies were in place after 1800 and given that the average age of mothers at last birth for those that married before the age of 30 was less than 40, ranging from 30 to 39 years over all TPs, the implication is that family limitation, if not stopping strategies, were in place from time-to-time.

One issue that has not been resolved is whether or not wet nursing was deployed to reduce the period of lactation and facilitate reproduction. Some of the average birth intervals are relatively short and those bordering on about 1.5 years or less invite speculation about whether wet nursing was used. For example the close average birth dates of children to mothers marrying between 30–34 years in the 1700–1749 TP suggest that wet nursing may have been practiced during that period. Elsewhere some evidence for the use of this practice by women belonging to this Meeting has been discovered by analyzing the demographic profiles of individual families (Coutts 2011).

Within the limits of the data available mortality was analyzed on a relative scale. Life expectancy increased from 1650 and in general females outlived males from 1750 onwards. The highest rates of age specific mortality occur for infants for both males and females. The index starts to drop away after 1800 for males and 1750 for females and, with one exception, in all TPs infant mortality is higher for males than for females and it is notable that once females reached the age of 45 they had a better chance of survival than males. The index for child mortality (aged 1–5) is very modest by comparison with infant mortality for all TPs. Notably the infant mortality rate increases with age of marriage and the highest index

was for mothers marrying when they were less than 20 years old and in the period prior to 1700. Otherwise the index drops through all TPs except for the under 24 age rank of the 1750–1799 TP. It is estimated that a very small proportion of mothers died in childbirth or within a year or so of childbirth over all TPs.

Probable causes of death were discussed at some length given that many persons seemed to have died relatively young in those times. It is likely that death from disease was common, spread through epidemics, virus or fevers, some of which appeared after major catastrophes such as famine. Others may have died from natural causes, but the fact remains there are no records for the causes of death for most of the population chosen for this study. Consequently speculation is inevitable.

The initial hypothesis that the demographic profile for the 1850–1899 TP might converge with that of the wider Irish population (inclusive of the Quakers, gentry, peasant population etc.), given the dilution of membership and a sample population made up of more worldly persons, is not supported. The Newgarden/Carlow profile has distinct characteristics, although some of its features are shared with the national profile, for example the tendencies for delayed marriage, reduced mortality and reduction in marriage fertility (although not so pronounced in the national profile and with regional variations).[43] However, average family size tended to be static for the National population while it dropped dramatically for the Newgarden/Carlow population. The average ASMFIs of the two populations also differed significantly, the latter being much lower than the former. It was argued that the Carlow/Newgarden profile differed because the sample was biased towards the middle class as it included gentry, well-off farmers, shop keepers and so on, but excluded members of the Catholic working class. The profiles for the predominantly Catholic and Newgarden/Carlow populations were affected by a number of common factors but to different degrees and to different extents. For example, emigration had a much greater impact on the poor than it did on the middle class; it affected the price and availability of labor, marriage and celibacy rates. Again the land reform Acts of 1848/9, 1870 and 1881 had a mixed effect on small farmers and peasants who had to survive during a period when there was a major shift from tillage to pasture spearheaded by landlords, together with a period of depression c. 1879 to 1896.[44]

In the foregoing the broad characteristics of a demographic profile for a population drawn from members and descendants of the Newgarden/Carlow Meeting have been summarised. It is clear the profile changed over time in almost every way. Family sizes grew smaller, marriage was undertaken later, lifespan increased, families were planned, occupations diversified and participation in community life was no longer restricted in any way especially among those who had turned their backs on the Religious Society of Friends. Members and their descendants dribbled into urban areas and started new families, new businesses and new lives. The Meeting was depleted by defections. Well-heeled children were continually lured and seduced by the temptations of the wider community and depressed by the restrictions imposed upon them by the Meeting. Many abandoned their drab dresses, wore wigs, went hunting and attended balls and race meetings. They

joined the gentry and mercantile elite, adopted airs and graces and lived in ostentatious houses. By the end of the nineteenth century the Newgarden/Carlow Meeting had become little more than an historical footnote with no one to praise its memory.

It remains now to see how this profile measured up to the one generated for the wider Quaker community (called here NDB). As the study progressed it became increasingly obvious that while the two data sets have much in common, there are a significant number of differences:

- With respect to age of marriage the two data sets exhibit similar trends toward delayed marriage from 1650, but Newgarden/Carlow females married slightly earlier and males later than those in those in NDB.
- The age difference between males and females at marriage is similar, but a slightly higher percentage of males from the Newgarden/Carlow population married younger women than in the NDB.
- The average family sizes for the Newgarden/Carlow population gradually reduce over time, but this pattern is not discernible in the NDB. In addition the average family sizes for the NDB tend to be slightly higher than those of the Newgarden/Carlow populations.
- There is a greater proportion of marriages of females under the age of 20 than in the NDB and there appears to be a reversion of the trend in the 1800–1849 TP, with men from the Newgarden/Carlow population marrying younger women, but this does not show up in the NDB.
- The behavior of the age-specific marital index by age of mother at marriage for the NDB is quite different from that of the Newgarden/Carlow database. In NDB the highest values tend to occur in the age rank that encompasses the age at marriage whereas the highest values in the Newgarden/Carlow database occur in the quinquennial following the one that encompasses the age at marriage, suggesting delayed births.
- For the NDB data, women that married in the 20–24 year range were most fecund in the 20–29 age rank whereas in the Newgarden/Carlow population for the same rank, women were most fecund in the 25–34 year rank and generally the value of the index is much higher for the NDB data. Likewise, for mothers that married in the 25–29 year range the highest values of the index occur in the 25–34 age rank for NDB and in the 30–34 year age rank for the Newgarden/Carlow data. Again the values of the index are much higher for NDB.
- The shapes of the age specific marital index curves through the marriage age ranks tend to be more flattened than those for the Newgarden/Carlow data, which tend to have sharper tails, an indication that different birth strategies may have been deployed, the flattened curves suggesting spacing or 'natural' births.
- Birth interval analysis of both sets of data revealed evidence of birth limitation after 1850, but the size of the average birth intervals are different and in general other inferences drawn from the Newgarden/Carlow

data are not supported by the NDB. For example, the magnitude of first birth intervals for the NDB tend to be smaller than those of the Newgarden/Carlow data (from which one can argue a case for delayed first birth).

- Analysis of the mortality data for Newgarden/Carlow suggested that life expectancy increased from 1650 for both males and females but while a similar trend was discerned in the NDB (recalling that the two different methods were used to calculate life expectancy which are not strictly comparable) the upward trend is nowhere as strong.
- The age specific mortality curves are quite different for the two sets of data. Not only are the values of the index different but the NDB results indicate higher mortality rates for children, sometimes greater than those for infants. A downward trend in infant mortality is apparent for both data sets but it is not as strong for the NDB.

Collectively the differences in the two data sets outweigh the similarities and consequently there appears to be an argument for variation, if not regional variation. This should not come as a surprise when one recalls that the NDB is an amalgamation of data from rural and urban areas, and that the Newgarden/Carlow Meeting was not only the smallest of all the Meetings in Ireland, but it was one of the most rural and therefore one of the most conservative communities. Given these results it would possibly be a rewarding exercise to conduct a similar analysis of data from the Dublin Meeting to provide comparative data for an urban area.

ACKNOWLEDGMENTS

I wish to thank Christopher Moriarty, the Curator of the Religious Society of Friends Library Dublin for his persistent and efficient help in providing information from the library and for the help and support provided by the Religious Society of Friends in general. I would like to thank my colleagues Drs Laila Hagland and Eleanor Crosby for their editorial and structural comments which are much appreciated.

ABBREVIATIONS

ASMFI	age specific marital fertility index
BDM	births deaths and marriages
DSFMFR	duration specific fecund marriage fertility index
FMFR	fecund marriage fertility rate
LDS	Church of the Latter Day Saints
Mths	months
NDB	National database (after Vann and Eversley 1992)
NGMMM	Newgarden men's monthly Meeting minutes
PO	period of observation
TP	time period (unless specified otherwise 50 years)

NOTES

1. The term 'fecundity' is used frequently in the following sections and following Wrigley et al. is taken to mean the 'capacity of an individual or couple to conceive'. Likewise 'fertility' refers to the scale of production (1997: 357).

2. Walsh (1970: 148). This trend appears to have started much earlier, in the 1830s (Cousens 1964: 317).

3. The ASMFI was calculated for women who gave birth to more than one child and for instances where women appear to have given birth to a single child where there was reasonable evidence that the mothers went to term. Women that married twice have been included and the date of the first marriage is the date used to categorise the age at marriage. One of the criteria for inclusion in the analysis was that at least 80% of the dates of birth of children had to be available. Others included mother's dates of birth and marriage. The ASMFI was also calculated for all data available using similar criteria, but employing the documented periods of observation to provide data for the denominator of the expression ($Esp_f + Esp_{nf}$). This approach increases the sample size.

4. Wrigley et al. (1997: 412) made a similar comparison of complete vs. incomplete data in their ASMFI analysis of English Parish populations and found that both approaches yielded similar results.

5. Wrigley et al. (1997: 398) have suggested that as a general rule fertility rates drop about 5-10% over each progressive 5-year period of marriage.

6. Jones (1968: 22) in his study of population and agrarian change in eighteenth century Shropshire has also attempted to interpret changes in the shapes of the ASMF curves to argue for control and lack thereof of fertility. This is a particularly interesting study as it compares profiles of farmers (defined as a family farming 10 or more acres—1968: 9) and laborers in a relatively small population with contrasting results, farmers exercising little or no control at any time and laborers exercising some degree of control of fertility after 1771.

7. The relevant data were extracted from Table 4.4 and plotted in the same format as Figures 2-5. The gradients of the graphed data were then analyzed for comparison with those for Newgarden/Carlow.

8. If the mean birth interval is B months then the estimated fecund fertility rate will be (1000/B) * 12.

9. Coale and Trussell (1974) have developed a statistical method of testing for family limitation but Vann and Eversley (1992: 178ff.) found that it gave inconclusive results for their data. Accordingly it has not been pursued here.

10. McLaren (1978: 378) has suggested that peasant families in England may have used breastfeeding as a means of prolonging post-partum amenorrhoea to limit family size during the seventeenth century, so why not elsewhere? By contrast it appears that English gentlewomen and women of higher rank tended not to breastfeed their children, using instead wet nurses (1978: 378). The role of wet nurses in Ireland (as elsewhere) has yet to be documented. Judged on entries in Friend's documents they may have been widely used before 1696 after which time mothers who wished to employ them had to get permission from their local meeting but otherwise were actively counseled to breastfeed their own children (Greaves 1997: 322-23). The topic of wet nursing arose again in 1707 at the Dublin Monthly Meeting suggesting that it was being deployed by some mothers at that time and Sophia Hume delivered an attack on the practice in 1751, an indication that it had not been stopped (Larson 1999: 159).

11. For example there was a smallpox epidemic in Ireland in 1741 (Vann and Eversley 1992: 188).

12. *The Belfast Newsletter*, 18 July 1769: 2. Part of the extract reads: 'WE the several principal Inhabitants of the County of Carlow, do Certify, in Justice to MR. Houlton, that he has Inoculated within the last four Months, our Children and above Six Hundred other Persons

whom he conducted through the Small Pox, with that Safety, Singularity and Dispatch which justly characterise the Suttonian Art of Inoculation. At the same Time, we thank the above Gentleman for his great Charity to the Poor of this County, Three Hundred of whom he inoculated gratis.' The document was signed by Carlow's leading citizens including John Watson of Kilconner who was still a Quaker at that time.

13. The index was calculated using only persons for whom both dates of birth and death are known and for this reason the values are likely to be conservative.

14. It is true that some persons would have been excluded from these calculations (because the dates of death were not available) and some of them would have died in the 1–4 year old rank, so that the indexes for the 1–4.99 year rank may have been a little higher if the relevant data were available.

15. A number of Quaker families were in poor circumstances after the end of the Williamite War, but the Meeting took care of them. There were several periods of famine and crop failures during the following two centuries culminating in the Great Famine of 1845–49. The first serious famine occurred in 1727–28 (Clarkson and Crawford 2001: 125) but there is nothing in the Meeting records that suggests members were affected. The great frost of 1739–40 resulted in a severe famine in 1740–41 when potato and corn harvests failed (2001: 126). There were poor harvests in 1756/57, severe shortages of food in 1783/1784 when frost damaged the potato crops, also in 1799–1800, 1801, 1816–17, 1822 and 1831 (2001: 127).

16. According to McCracken (1986: 33-34) between 200,000 and 400,000 persons died between 1740–41 during the epidemic, most probably of typhus and dysentery.

17. NGMMM.

18. The date is incorrect as the father had already expired in 1710.

19. *Journal of the Friend's Historical Society* X(1) (1913), p. 171.

20. Of Seskin, County Carlow.

21. Of Ballybrommell, County Carlow.

22. 1816–19, 1826–27, 1836–37, 1846–49.

23. He was laid up with what Leadbeater described as a 'low fever' for 8 days before dying at the house of John Gatchell on the 28/2/1792 (Leadbeater 1822: 215-16).

24. She used terms such as 'pleuretic fever', 'putrid fever', 'dangerous fever' 'low fever', and 'malignant fever'. Thomas Carleton died of fever a year after his marriage in 1780 (Leadbeater 1822: 43) and Abraham Shackleton contracted fever in 1767 and was bedridden for 4 days before he recovered (1822: 43).

25. She was resident in the Clonmel district of County Tipperary.

26. One possible way of allocating socio-economic status to individuals residing in rural areas is to base it on the size of their land holdings. O'Grada (1989: 114), for example, used the information from the 1841 census to distinguish six gradations: laborers holding 1 acre or less, poor peasants holding between 2 and 5 acres, 'family' 6-20 acres, 'comfortable' 21-50 acres, 'rich' 51-80 acres and landlords/farmers greater than 80 acres. However it is difficult to apply this approach to earlier populations as such data are not readily available, there being no reliable census data for one thing. There are basically three sources of information on land holdings, wills, land memorials and residential information contained in birth, death and marriage records and records of sufferings. Unfortunately only a handful of wills have survived and most of these do not contain details of land holdings. Moreover, wills often contain financial information that provides a more reliable means of assessing socio-economic status than land holdings. Land memorials, when they are available, usually contain useful socio-economic data. However, few land memorials are available for the period before 1708 when the land registration system in Ireland was first deployed (Ryan 1997: 10). Even after this date it was not compulsory to register deeds and many were not registered. Moreover, the task of tracing deeds originating from transactions involving the numerous Quaker families from c. 1660 is currently being addressed and is beyond the scope of this project. Residential information contained in other

records, can, it is true, be used to determine the size of holdings. This can be done by looking up the acreages of Townlands in sources such as the G.A.I.T.T. (1984). However, in order to use these data one has to make the assumption (in the absence of additional information) that the parties involved leased the whole of the Townlands and this was not always the case.

27. Solomon Watson son of John Watson and Sarah Pim, d. 1815. John Lecky b. 27. September.1764, d. 11.May.1839 was also a banker/merchant.

28. John Boles Watson b. 09.Jan.1749 d. 1813.

29. John Watson b. c. 1744 d. 1789.

30. E.g. Henry Sewel Stubber Watson b. 1823 d. 16.June.1876; John Walker Watson b. 1829 d. June 1878.

31. E.g. Robert Thomas Cooper b. 1845 d. 1903 MD.

32. E.g. Thomas Cole m. 09.May.1830, schoolmaster at Ballytore; James White b. 09.Oct.1778 d. 26.Oct.1847 schoolmaster, Ballytore.

33. Mainly the Churches of Ireland and England. E.g. Thomas Henry Watson b. 25.July.1825 d. 28.Nov.1897 vicar; Francis Watson b. 03.Sept.1824 d. 1876 Rev.; Robert Cooper b. 15.Aug.1802 d. 1879 Rector.

34. E.g. William Chapman m. 21.Feb.1839; Samuel Grubb b. 16.Sept.1809 d. 04.Feb.1843; Fredrick Grubb b.04.05.1825 d. 1891.

35. E.g. Robert Lecky Watson b. 14.Sept.1836 d. 21.Nov.1906.

36. E.g. John Jenkinson Wright m. 17.May.1815 shopkeeper, Hugh Woods m. 1829 grocer.

37. E.g. Robert John Lecky b. 25.March.1809 d. 11.Nov.1897.

38. E.g. John Gray Watson b. 1821 d. 06.Aug.1908 High Sheriff of Carlow, Treasurer of County Carlow; John Lecky Watson magistrate b. 23.June.1803 d. 09.Sept.1870; John Henry Watson b. 05.April.1787 d. 22.May.1869 High Sherriff C. Carlow, member of Grand Jury from time-to-time; Thomas Henry Watson b. 07.Sept.1790 d. 07.Jan.1853 magistrate and member of Grand Jury from time-to-time; William Cooper b. 02.Feb.1757 High Sherriff C. Carlow; John Dawson Duckett b. 10.Aug.1791 d. 27.Sept.1866 High Sherriff C. Carlow.

39. George John Watson b.18.June.1826 d.11.July.1906.

40. Henry Sewel Stubber Watson (see above).

41. E.g. John Henry Watson b. 1851 d. 14.Nov.1908, top polo player for Ireland.

42. E.g. Thomas Watson b. 07.Sept.1790 d. 07.Jan.1853 Captain Carlow militia; John Henry Watson 13th Hussars British Army (see above).

43. Fitzpatrick 2010: 628; McKenna 1974: 703; Walsh 1970: 154.

44. Gribbon 2010: 262-64.

REFERENCES

Anderson, M. (1998), 'Fertility Decline in Scotland, England and Wales, and Ireland: Comparisons from the 1911 Census of Fertility', *Population Studies* 52/1, pp. 1-20.

Anon. (1913), 'Record of Friends Traveling in Ireland 1656–1765', *Journal of the Friend's Historical Society* 10/1, pp. 157-80.

Bates, B. (1992), *Bargaining for Life: A Social History of Tuberculosis, 1876–1938*, Philadelphia: University of Pennsylvania Press.

Churchman, J. (1779), *An account of the gospel labours, and Christian experiences of a faithful minister of Christ, John Churchman, late of Nottingham, in Pennsylvania, deceased. To which is added, a short memorial of the life and death of a fellow labourer in the church, our valuable friend Joseph White, late of Bucks County*, Philidelphia: Joseph Crukshank.

Clarkson, L.A., and Crawford, E.M. (2001*), Feast and Famine: Food and Nutrition in Ireland, 1500–1920*. Oxford: Oxford University Press.

Coale, A.J., and Trussell, J.T. (1974), 'Model Fertility Schedules: Variations in the Age Structure of Childbearing in Human Populations', *Population Index* 40, pp. 185-258.

Cousens, S.H. (1960), 'Regional Death Rates in Ireland during the Great Famine, from 1846 to 1851, *Population Studies* 14/1, pp. 55-74.

— (1964), 'The Regional Variations in Population Changes in Ireland', *The Economic History Review*, New Series 17/2, pp. 301-21.

Coutts, P.J.F. (2011), 'Families in Transition: Edward Cooper and the Cooper Family of Carlow and Queen's County, Ireland', Unpublished Ms.

Crawford, M. (1999), 'Typhus in Nineteenth-century Ireland', in Malcolm and Jones (eds.), *Medicine, Disease and the State in Ireland*, pp. 121-37.

Cullen, L.M. (1972), *An Economic History of Ireland Since 1660*, London: B.T. Batsford.

Edwards, D.P. (2000), *Our Quaker Ancestors, Thomas Hutton—ca 1600*, Private publication cited in LDS FHL Cat no 929.273 H979ed.

Eustace, P.B. (ed.) (1956), *Registry of Deeds, Dublin: Abstract of Wills 1708–1745*, vol. I, Dublin: Stationary Office for the Irish Manuscripts Commission.

Eustace, P.B., and Goodbody, O.C. (1957), *Quaker Records Dublin: Abstracts of Wills*, Dublin: Dubin Stationary Office.

Fitzpatrick, D. (2010), 'Imigration, 1871–1921', in Vaughan (ed.), *A New History of Ireland: Ireland under the Union 1870–1921*, pp. 606-52.

G.A.I.T.T. (abbrev.) (1984), *General Alphabetical Index to the Townlands and Towns, Parishes, and Baronies of Ireland: Based on the Census of Ireland for the Year 1851*, Baltimore: Genealogical Publishing. First published by A. Thom for H.M.S.O. in 1861.

Gribbon, H.D. (2010), 'Economic and Social History, 1850–1921', in Vaughan (ed.), *A New History of Ireland: Ireland under the Union 1870–1921*, pp. 260-356.

Greaves, R.L. (1997), *God's other Children: Protestant Nonconformists and the Emergence of Denominational Churches in Ireland, 1600–1700*, Stanford: Stanford University Press.

— (1998), *Dublin's Merchant Quaker: Anthony Sharp and the Community of Friends, 1643–1707*, Stanford: Stanford University Press.

Grubb, I. (1927), *Quakers in Ireland 1654–1900*, London: Swarthmore Press.

Jones, G. (1999), 'The Campaign against Tuberculosis in Ireland, 1899–1914', in Malcolm and Jones (eds.), *Medicine, Disease and the State in Ireland*, pp. 158-76.

Jones, G., and Malcolm, E. (eds.) (1999), *Medicine, Disease and the State in Ireland, 1650–1940*, Cork: Cork University Press.

Jones, R.E. (1968), 'Population and Agrarian Change in Eighteenth Century Shropshire Parish', *Local Population Studies* 1, pp. 6-29.

Kelly, J. (1999), 'The Emergence of Scientific and Institutional Medical Practice in Ireland, 1650–1800', in Malcolm and Jones (eds.), *Medicine, Disease and the State in Ireland*, pp. 21-39.

Larson, R. (1999), *Daughters of Light: Quaker Women Preaching and Prophesying in the Colonies and Abroad, 1700–1775*, New York: Alfred A. Knopf.

Leadbeater, M. (1822) *Memoirs and Letters of Richard and Elizabeth Shackleton Late of Ballytore, Ireland*, London: Harvey & Darton.

— (1823), *Biographical Notices of Members of the Society of Friends Who Were Resident in Ireland*, London: Harvey & Dalton.

— (1862), *The Leadbeater Papers: The annals of Ballitore with a memoir of the author: letters from Edmund Burke heretofore unpublished: and the correspondence of Mrs. R. Trench and Rev George Crabbe with Mary Leadbeater*, London: Bell & Daldy.

Leadbeater, M., and Shackleton, E. (1814), *Tales for Cottagers Accommodated to the present Condition of the Irish Peasantry*, Dublin: James Cumming for John Cumming.

McKenna, E.E. (1974), 'Marriage and Fertility in Post Famine Ireland: A Multivariate Analysis', *American Journal of Sociology* 80/3, pp. 688-705.

Pigot & Co's (1824), *The commercial directory of Ireland, Scotland, and the four most Northern Counties of England for 1820–1, 1822 & 1824: containing a representation of the professional and mercantile inhabitants of the principal towns, with sketches and ancient and modern history, and a variety of matters of local and general interest*, London: Charles Gilpin.

McCracken, J.L. (1986), 'The Social Structure and Social Life, 1714–60', in W.E. Vaughan (ed.), *A New History of Ireland*. IV. *Eighteenth-century Ireland 1691–1800*, Oxford: Clarendon Press, pp. 31-56.

McLaren, D. (1978), 'Fertility, Infant Mortality, and Breast Feeding in the Seventeenth Century, *Medical History* 22, pp. 378-96.

O'Grada, C. (1989), 'Poverty, Population and Agriculture, 1801–45', in W.E. Vaughan (ed.), *A New History of Ireland*. V. *Ireland under the Union, I 1801–1870*. Oxford: Clarendon Press, pp. 105-36.

Ryan, J.G. (1997), *Irish Records: Sources for Family and Local History*, USA: Ancestry Inc.

Savery, W., and Evans, J. (1844), *A journal of the life, travels, and religious labors of William Savery, late of Philidelphia: a Minister of the Gospel of Christ, in the Society of Friends*, London: C. Gilpin.

Scott, J. (1798), *Journal of the life, travels and gospels of Job Scott*. Dublin: John Gough.

Vann, R.T., and Eversley, D. (1992), *Friends in Life and Death: The British and Irish Quakers in the Demographic Transition, 1650–1900*, Cambridge: Cambridge University Press.

— (2002), *Friends in Life and Death: The British and Irish Quakers in the Demographic Transition, 1650–1900*, Cambridge: Cambridge University Press

Vaughan, W.E. (ed.) (2010), *A New History of Ireland: Ireland under the Union 1870–1921*, Oxford: Oxford University Press.

Walsh, B.M. (1970), 'Marriage Rates and Population Pressure, Ireland 1871 and 1911', *Economic History Review*, 2nd Series 23, pp. 140-62.

Wells, R. (1971), 'Family Size and Fertility Control in Eighteenth Century America: A Study of Quaker Families', *Population Studies* 25(1), pp. 73-82.

Wrigley, E.A., Davies, R.S., Oeppen, J.E., and Schofield, R.S. (1997*), English Population History from Family Reconstitution 1580–1837*, New York: Cambridge University Press.

NEWSPAPERS

The Belfast Newsletter

Religious Society of Friends Historical Library, Dublin

NGMMM (abbrev.). Newgarden Men's Meeting Minutes. Ms MM I a1-A4, F1b.

SOFHL (abbrev). *A Testimony given forth by Friend's of New Garden Monthly Meeting in Ireland, concerning our dear Friend John Watson who departed this life at his house at Killconner* [*sic*] *in the County of Carlow the nineteenth of the first month 1710*. In Grubb Collection—Commonplace Book III pp. 135ff No 189.

AUTHOR DETAILS

Peter J.F. Coutts is an Australian archaeologist whose research has focussed on aspects of economic prehistory and historical archaeology variously in Australia, New Zealand, New Guinea and the Philippines. He was the foundation Director of the Victoria Archaeological Survey and was Honorary Senior Research Fellow in the Prehistory Section of the History Department, LaTrobe University at the time of his retirement from both posts in 1986. Dr Coutts is also a competent computer programmer/analyst and author of a wide variety of publications that deal mainly with archaeological and historical topics. In his retirement he has devoted much of his time and energy to researching the economic and social history of Irish Quakers, inspired by a latent interest in Irish Church history and churches.

Mailing address: 17 Byfield Court, Nerang, Qld, Australia 4211.
Email: pjfc@tpg.com.au.