

THE PAST POPULATION OF BRITAIN: AN ARCHAEOLOGICAL APPROACH

by

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CONJECTURAL estimates of the early population of Britain are subject to wide margins of error. Professor Grahame Clark (1957) has put forward tentative figures of early prehistoric numbers, based upon the native population density in newly colonized lands. The Upper Palaeolithic population density of Britain was compared to that of Alaska in 1867 and the North-West Territories in 1911, and the Mesolithic to that of Tasmania. Since prehistory has no specific dates, being measured in periods of hundreds or even thousands of years, overall numbers must be similarly imprecise in date. Again, the colonial figures themselves are only estimates (the two Palaeolithic estimators being in the ratio 20:3), so that the estimates of prehistoric population might not even be of the correct order of magnitude.

Estimates of between a half and one and a half million have been made for the population of Roman Britain in the second century A.D., based upon different interpretations of the evidence for population density of town and country (Wheeler, 1930). Here we have agreement on the order of magnitude, but the estimates are still imprecise in date and size.

The original (geographical) returns of Domesday Book, begun in 1085, are lost, and only parts survive of the summarized returns on a feudal basis. The final result was a still further condensed version. The division is by counties (many of whose boundaries have radically altered), subdivided by estate holders. The northern counties were not surveyed, and records of towns are incomplete or missing entirely. Various classes of tenant are recorded; each *may* be the head of a household of unknown size, although serfs seem to have been enumerated individually (Darby, 1952). Duplication of landowners and under-tenants is probable, but the population may

be put at between one and one and a half million, little different from that 900 years before.

Medieval estate surveys usually list tenants owing feudal duties, but exclude dependants and the clergy. The poll tax returns of 1377 and later, and the chantry certificates of 1545 should provide an accurate count of the adult population, but historians disagree about the amount of evasion of the former and the degree of inflation of the latter. There are similar difficulties in using the late medieval muster returns of men of military age. A few scraps of evidence about medieval family size have been used to rate up these numbers by factors of from 1.5 to 5, but the basic data may be inaccurate, and the evidence of family size unrepresentative. The 'dependency ratio' has been argued *ad nauseam*; the simple truth is that there is insufficient evidence for an accurate figure.

The population of England and Wales in 1695 was put at 5½ millions by Gregory King, on the basis of a fairly representative sample of the population (Glass, 1950*a*). Some attempts at assessing the numbers of people in the seventeenth and eighteenth centuries, a period of considerable movement and expansion, have been based upon the ratio of population (as recorded in the 1801 and later censuses) to parish registrations of births, marriages and deaths (Rickman, 1812, etc.). But the series published are inconsistent around 1700, and are based upon partial returns. An almost unknown census of Scotland in 1755 has recently been published, with an entertaining account of its origin and compilation (Kyd, 1952).

It has been suggested that changes in population can be measured from the clearance of land, or the contraction of settlements. Thus the expansion of Iron Age Britain is attributed to advanced agriculturalists displaced from the Continent by the Roman invasions. On the other hand, the Saxon clearance of woodland is due more to a displacement of the urbanized Romano-Britons by rural communities than to a dramatic increase in numbers. Further, the deserted village is more often the result of migration than population decline.

SETTLEMENT SIZE

A greater knowledge of the composition of individual settlements would help in determining total populations (e.g. Cooper, 1947). More detailed methods than those used above can be employed. Eversley (1957) has traced the individual Bromsgrove residents through the parish registers from 1660 onwards and the same can be done elsewhere where written records survive. Where these are lacking, archaeological methods must be used. Work in progress includes the scientific excavation of an entire medieval village whose inhabitants migrated, and it may be possible to apply life-table methods to assess the units of population.

The period of use of a cemetery can only be measured approximately by dating the objects recovered, unless there is documentary evidence. Modern scientific techniques give promise of greater accuracy in chronology; the measurement of the rate of decay of radioactive carbon samples is subject to an appreciable margin of error, but the determination of the direction of 'fossilized' magnetism in baked clay can provide dates to within 10 years or less. The origin, expansion, and decay of a settlement can be inferred, and an estimate obtained of the deaths in a given period. Special circumstances can provide partial counts over a short period of time. A sudden catastrophe can give a grim census at a known date, while a massacre burial is likely to be deficient in healthy adults, taken as slaves. A battlefield would only yield adult male skeletons, while an epidemic may lead to excess infant deaths. Two examples may be quoted.

The storming of the native hillfort at Maiden Castle, Dorset, by the Romans in A.D. 44 culminated in the slaughter of a group of inhabitants, who were buried where they fell (Wheeler, 1943) and a group of executed persons from Dunstable has also been excavated. (Dunning *et al.* (1931) consider them Saxon, but Dingwall & Young (1933) think a pre-Roman type more likely.) The age distributions are shown on p. 448.

The Maiden Castle group might be considered complete, but where were the children? Even if the infants escaped, one would expect at least one youth in the front line, so that the group may

Maiden Castle			Dunstable		
Age	M.	F.	Age	M.	F.
18-20	—	1	0-20	2	2
20-30	4	3	20-25	11	3
25-30	4	2	25-30	22	2
25-35	6	3	30-35	13	2
30-40	3	—	35-40	3	2
40-50	1	—	40-2	1	—
50-60	1	—			
Adult	3	1			
Unknown		2			

have been 50 strong if we allow for refugees. The preponderance of young adult males in the second group points to a raiding party with a few followers, or early pioneers rather than settlers, derived from a parent population of about 300.

Today more accurate determinations of age and sex can be made from the bones of a skeleton (Cornwall, 1956). A rough estimate to within 10 years can be obtained from the disappearance of the sutures between the bones of the skull. The ossification and fusing of the epiphyses of the longbones (*a*) and the eruption and replacement of teeth (*b*) allow an accurate determination of the nearest age of death up to age 20:

(*a*) 0 1 2 3 4 5 . . . 9 . . 12 13 . . 16 17 18 . 20

(*b*) 0 1 6 7 8 9 10 11 12 13 . . . 17 . . .

Mention should be made of an estimate of the prehistoric population of the 'henge' monument at Dorchester, Oxon (Atkinson *et al.*, 1951). A number of single cremations over intervals of time were closely examined and, of a group of twenty-two individuals, one child was identified together with six young adults and three middle-aged persons. By ignoring infant mortality and assuming the respective ages at death were 10, 20 and 40, an expectation of life of 25 years was obtained. From this a tentative estimate of the population was made by considering the likely number of generations involved. The technical achievement of building the monument could thus be measured, albeit roughly, against the manpower available.

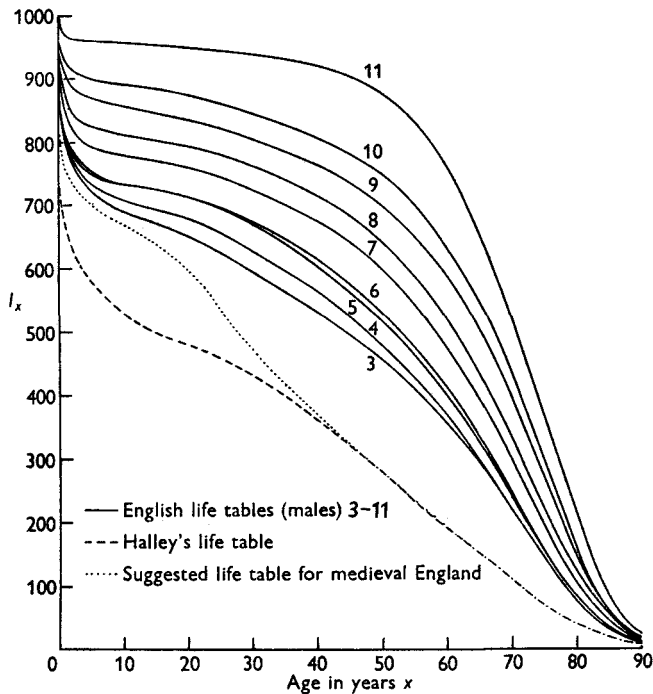
LIFE TABLES

Insufficient data are at present available to construct an early life table entirely from experience, and there are difficulties in matching such rates as are available to the array of United Nations models (United Nations, 1955). These latter were based upon the correlation between successive values of ${}_5q_x$ of a wide range of modern life tables, of varying degrees of accuracy and relating to many different races and environments. The U.N. method has been criticized on statistical grounds (Gabriel & Ronan, 1958) and practical experiments have met with limited success. This led Carrier (1958) to suggest that modified models, conforming more to the early English Life Tables, could be employed.

The graphs show the English Life Tables (males), nos. 3-11; the first two English Life Tables relate to essentially the same date as the third. Noting the parallelism of the curves, it is tempting to extrapolate to obtain earlier life tables. If this is done, English population mortality at the end of the seventeenth century would be very similar to that of Halley's Breslau Table of 1687-91 (Greenwood, 1942) which is also shown. However, although the English Life Tables are normally at 10-year intervals, the wide gap between E.L.T. 10 and 11 reflects a 20-year interval (1931-51) and that between E.L.T. 3 and 4 conceals an even larger interval of time (1841/51-1871). Again, E.L.T. 5 and 6 are almost identical, so that there may well be a limiting mortality table only a little below E.L.T. 3. If we go too far, a stage is reached where a population must fail to replace its losses, and there is no evidence of a population decline in Britain except at a time of migration or plague.

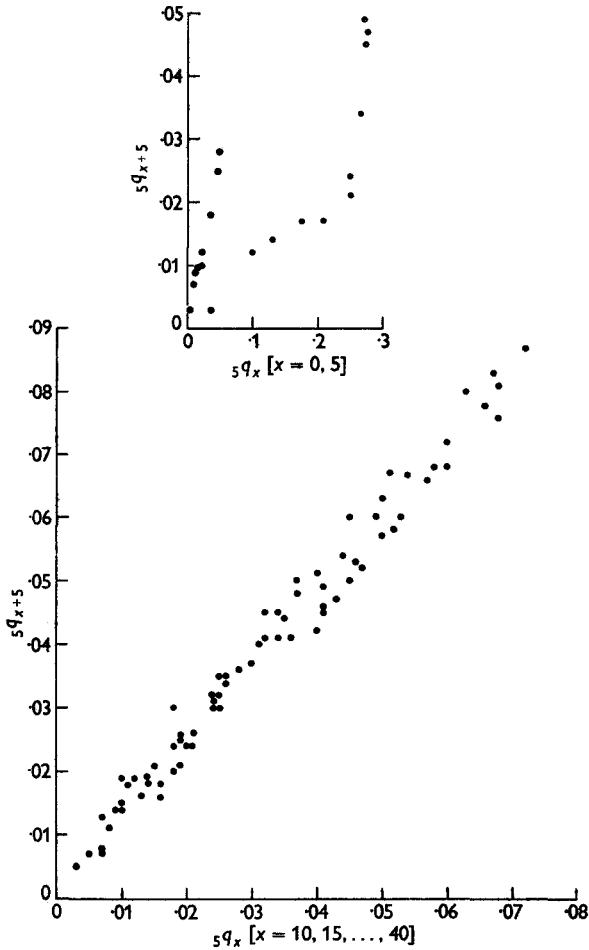
Graunt took the London bills of mortality for 1629-58, excluded the years for which plague was a major *reported* cause of death (1637-46) and assigned the remaining deaths to broad age-groups by cause, interpolating on the pivotal values (Greenwood, 1942; Glass, 1950*b*). His 'life table' is almost a hyperbolic curve; it shows lighter infant mortality than Halley's table, but mortality increases more rapidly thereafter, and the two curves intersect at age 11. Other epidemics (including unreported plague) must have been

rife in London (Graunt himself noted that the crude death-rate of Romsey (Hants) was only one-half that of London) and Graunt's table compares closely with one derived by Russell (1948) from the experience of male landholders in the Black Death of 1348-50 except that, at young adult ages, Graunt's rates are some 20% worse.



Graph 1. Life tables—curve of l_x .

Professor Russell has studied the deaths recorded in the medieval *Inquisitions post mortem*. These were held immediately after the death of a landholder, when disinterested persons attested the age of the deceased and of his heir. The records are incomplete; deaths of infants went unrecorded, and there is an increasing discrepancy in age between the year of birth derived from the declaration at inheritance and at death. This is only to be expected, since memory



Graph 2. English Life Tables (males). Scatter diagrams of $5q_x$.

is more fallible when the time interval is greater. How far even the rates for ages 10–25 are representative of *population* mortality is uncertain; any difference in nutrition between classes may be offset by environmental risks. A century ago, the mortality of young adults of both sexes was only 2% heavier than that of males alone, and today male adult mortality is considerably heavier than that of

females. Let us assume for present purposes that one-half of Graunt's excess mortality was due to immigrant deaths, and half due to extra maternal mortality in near-epidemic conditions. Then a 5 % loading of male mortality rates should provide a reasonable estimate of medieval population mortality among young adults, in times when there was no epidemic.

The scatter diagrams (E.L.T. males data), on p. 451, suggest an approximately linear correlation between ${}_5q_x$ and ${}_5q_{x+5}$. However, ${}_5q_0$ tends to an upper limit of $\cdot 3$ and we must beware of extrapolating too far. A number of experiments with Russell's data suggested that the most reasonable and consistent medieval experience available for the ages 10–25 was that for the years 1280–82 and 1310–12. These were therefore averaged, loaded as indicated in the previous paragraph, and blended into Halley's table at age 45:

x	0	5	10	15	20	25	30	35
${}_5q_x$	$\cdot 30$	$\cdot 04$	$\cdot 04$	$\cdot 07$	$\cdot 10$	$\cdot 12$	$\cdot 13$	$\cdot 13$
l_x	100	70	67	64	60	54	48	42

x	40	45	50	55	60	65	70	75
${}_5q_x$	$\cdot 14$	$\cdot 14$	$\cdot 17$	$\cdot 17$	$\cdot 21$	$\cdot 27$	$\cdot 36$	—
l_x	37	32	28	23	19	15	11	7

Can we justify this estimated table for medieval England on general grounds? The medical evidence related to population changes in eighteenth-century England have been discussed by McKeown & Brown (1955), who comment upon the important changes in maternal mortality and the effects of environment. A baby was a more precious asset in a village than in a town, and stood a better chance of survival. Thus the infant mortality rate for England before the Agricultural and Industrial Revolutions might well be below that of the towns of Graunt and Halley. The considerable improvement in adult mortality with time may be due partly to improving midwifery and partly to improving environment. Medical science has made more limited progress with the diseases of later life.

AN EXPERIMENT USING LOCAL RECORDS

A pilot experiment was carried out to test this proposed life table, assuming that it was appropriate until the beginning of the eighteenth century. Barnet in Hertfordshire had a market charter in 1199, but the population was only 1250 in 1801. Before the sprawl of London converted it into a dormitory suburb, it was a small market town halfway between London and St Albans Abbey, with a fairly stable resident population. The burial registers start in 1679*, reflecting some minor epidemics at first. The thirteen years 1689-1701 are reasonably uniform, however, if we exclude the burials of travellers and strangers:

Year	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	Total
Males	14	14	14	14	15	10	12	18	24	10	12	20	16	193
Females	13	12	11	11	18	16	16	12	26	12	11	12	17	187
Total	27	29	25	25	33	26	28	30	50	22	23	32	33	380

There is an average of 29 deaths per annum, or 27 if we exclude the year 1697. From our life table, e_0 is 31.2, so that the estimated stationary population at mid-1695 is $29 (27) \times 31.2$, or 905(842). Barnet was one of Gregory King's sample towns, and his figure for the population was 850. We do not have any analysis of this number and cannot check whether it is an actual enumeration or only a round figure. If King's 'Barnet' includes the parish of East Barnet, the average deaths are increased by 6 or 7 (depending again whether the 'epidemic' year 1697 is excluded or included) to give an estimated population of 1030 to 1123. This inclusion is unlikely, since the two parishes were separated, nominally and economically, by the fourteenth century.

Since the Chipping Barnet baptism registers commence only in 1705, we cannot use them to obtain the age at death of earlier burials, or to check the stability of the population against the burial registers. Even if the appropriate burials could be identified among the dead packed around and under the church, it would be next to impossible to re-articulate the skeletons and so determine their

* I am indebted to Mr H. W. F. Godley for the loan of his transcript of these registers.

ages at death. It is also unfortunate that the data necessary to apply Mr Carrier's criteria are not available in this case. This very imperfect life table is put forward tentatively; it is for the archaeologist and historian to provide material to test and improve it.

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