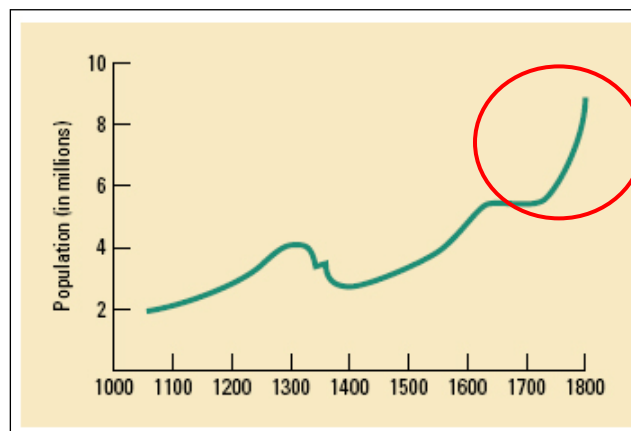


## Population Revolution

- What is the Population Revolution?
- The Idea of the Demographic Transition
- The mortality thesis
  - Public health, medicine, smallpox (Griffith, Razzell)
  - Food supply (McKeown)
- The fertility thesis
  - The European marriage pattern (Habbakuk, Krause)
  - Cambridge Group for the History of Population and Social Structure

## Population of England, 1000-1800



**"Population Revolution"**

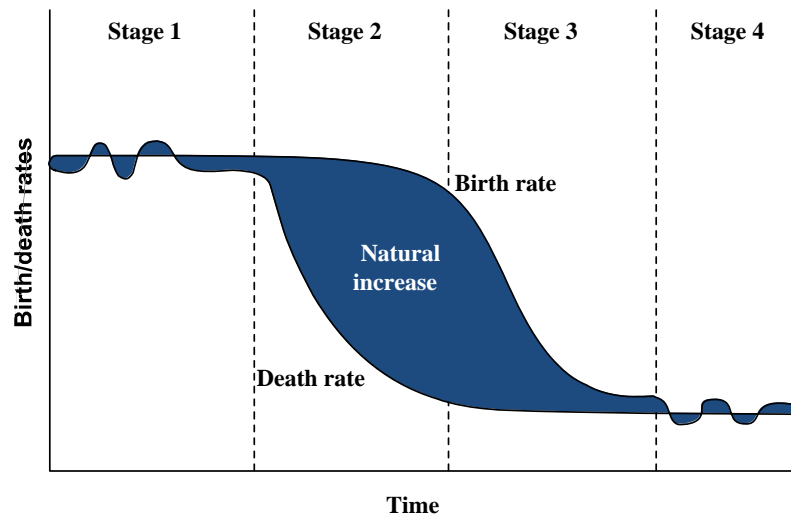
## Population Revolution

- The longest-running debate in demographic history, and one of the most fiercely contested
- Began with Malthus (1796), soon after rapid growth began
- Hundreds of books and articles since 1950s

## How do we know 18<sup>th</sup> c. population size?

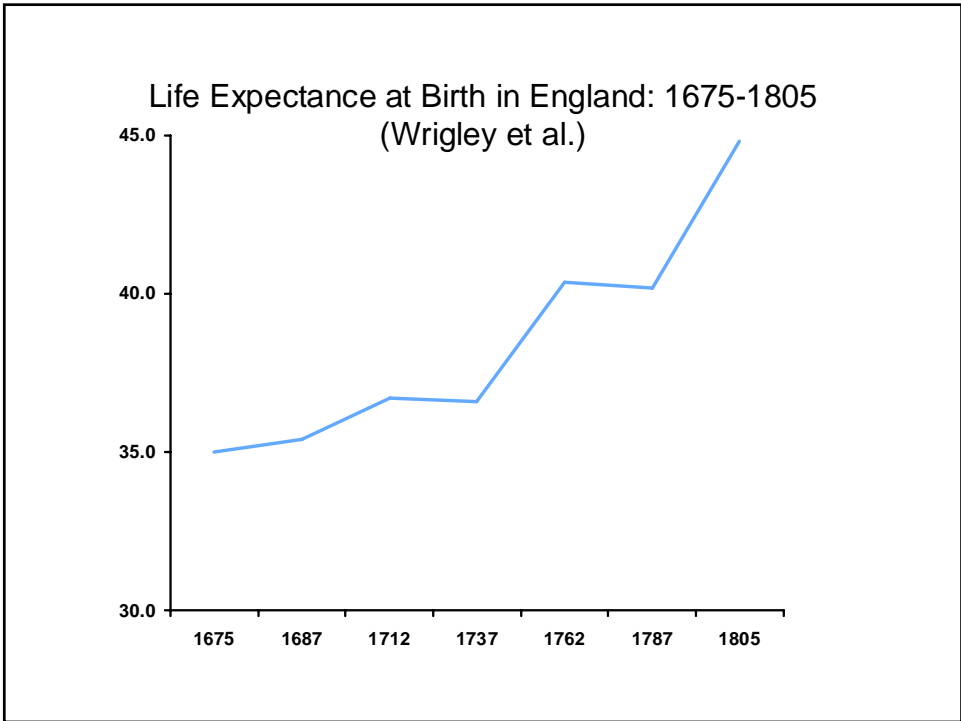
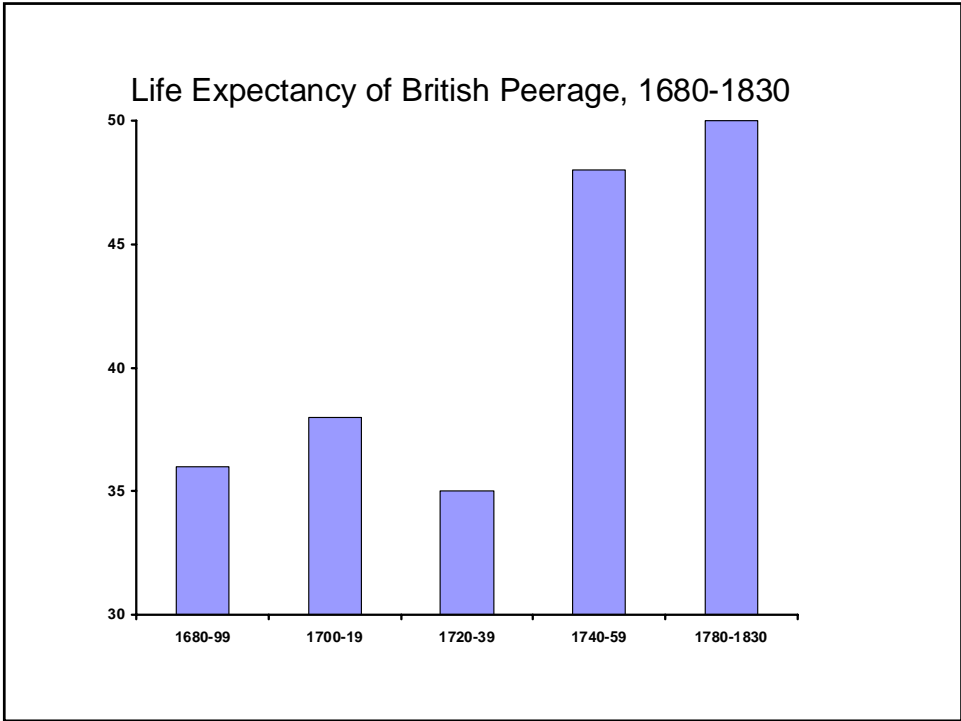
- Census began in 1801 (and the first couple weren't all that good)
- Each parish provided number of baptisms, marriages, and burials in the Anglican church, every 10<sup>th</sup> year from 1700-1780 and every year 1780-1800
  - Nonconformism (grew over time)
  - Underregistration (may have declined over time)
- Recent techniques for analyzing surviving parish registers
  - Aggregative analysis
  - Family reconstitution

## Demographic Transition Theory



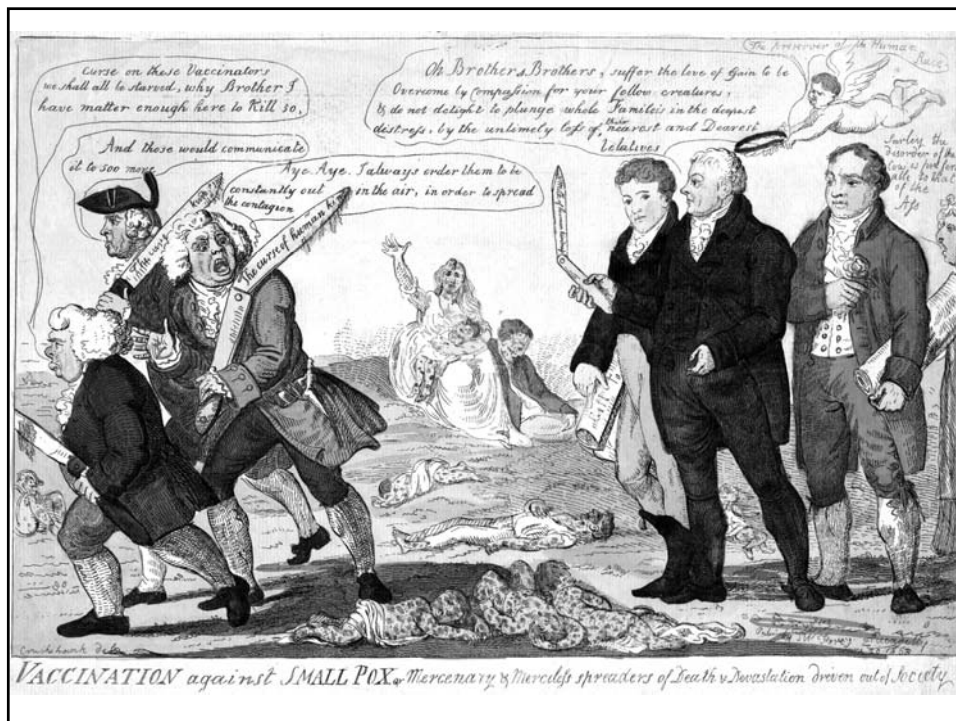
### 1. The Mortality Thesis

- Mortality dropped in the middle of the 18<sup>th</sup> century
- Fertility did not begin to drop until the end of the 19<sup>th</sup> century
- With lowered mortality and fertility still high, population grew rapidly
- Similar to pattern of demographic changes occurring in developing countries



## Hypothesized Causes of Mortality Decline

- Griffith (1926): Public Health and medicine
- McKeown (1955): Medicine hurt more than it helped; mortality declined because of improved food supplies owing to agricultural innovation
- Razzell (1965): Smallpox inoculation





## 2. The Fertility Thesis

Alternative theory: mortality remained constant—  
or maybe even increased—but fertility grew.

Why might mortality rise?

- Standard of living debate
- Rapid urbanization after 1750

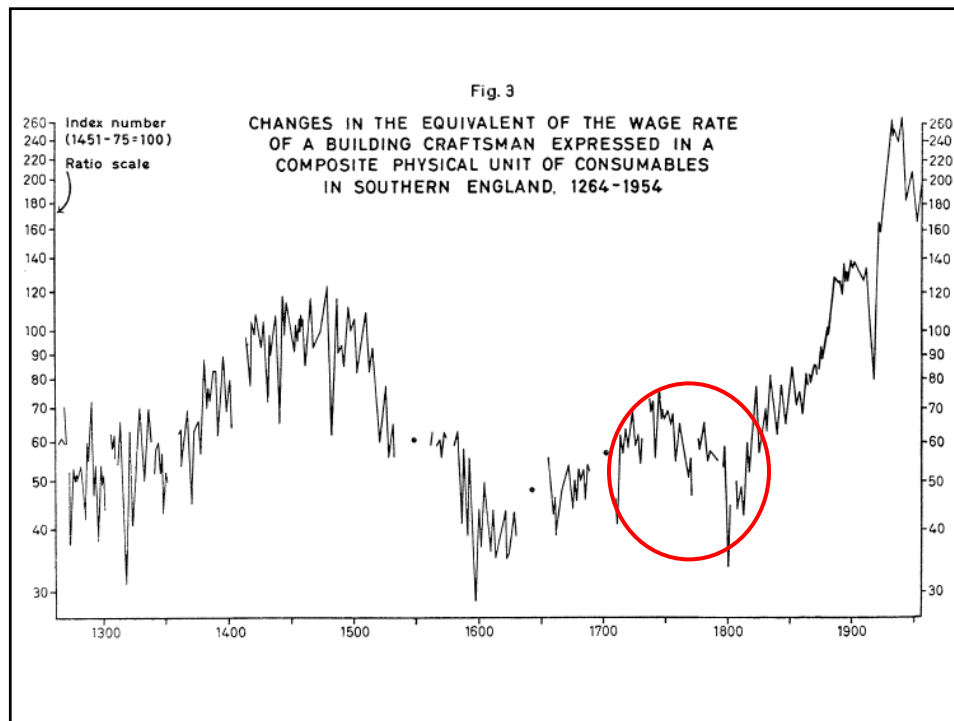
## Seven Centuries of the Prices of Consumables, compared with Builders' Wage-rates

By E. H. PHELPS BROWN and SHEILA V. HOPKINS<sup>1</sup>

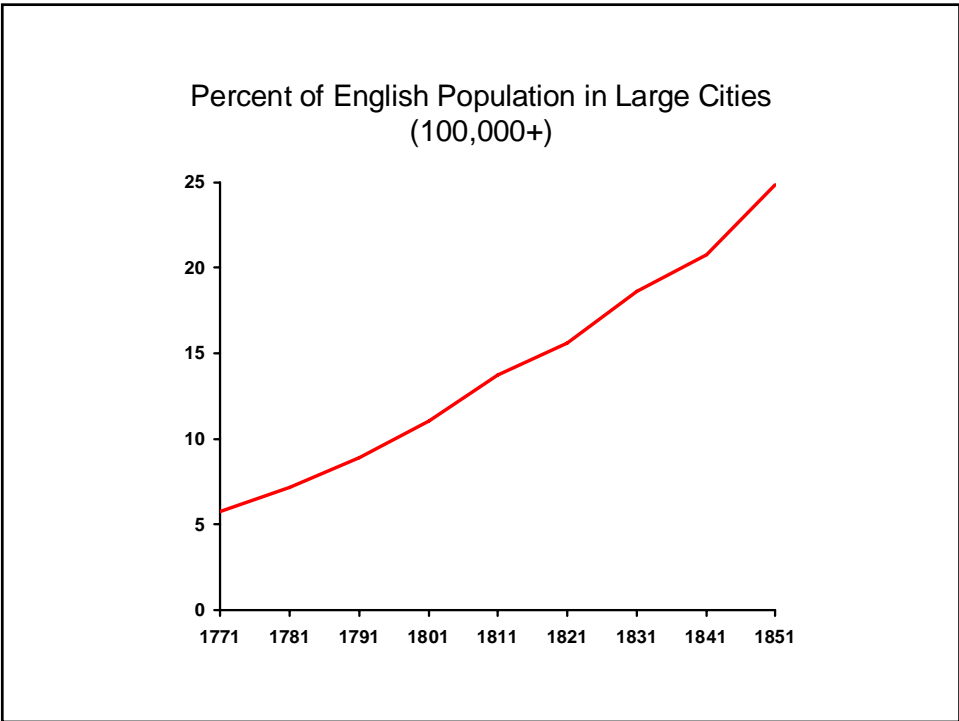
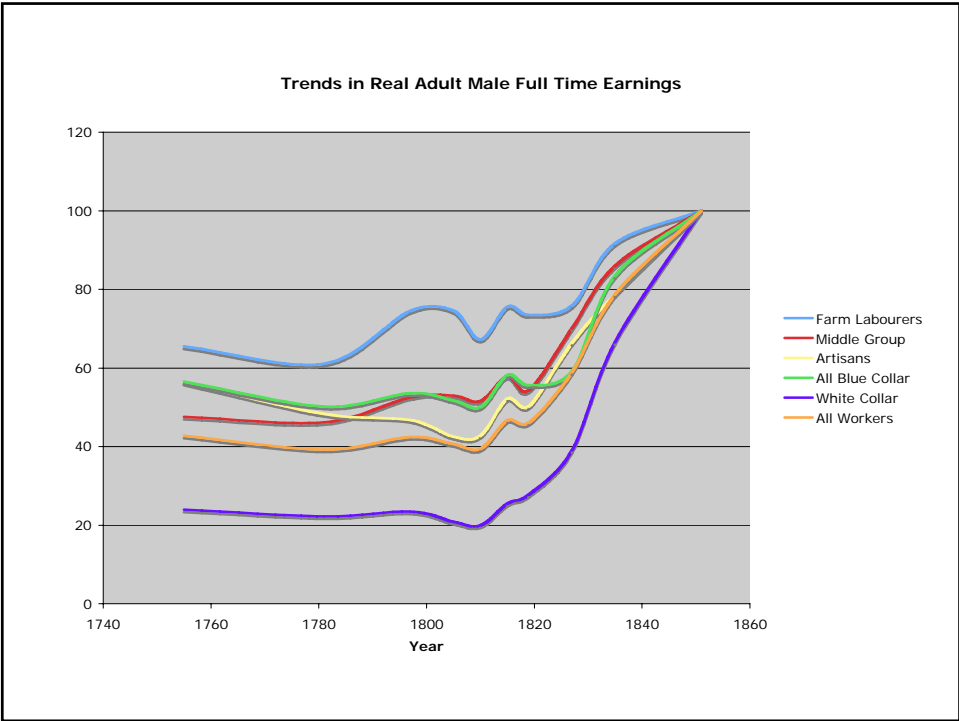
In an earlier paper<sup>2</sup> we gave an account of builders' wages in southern England from 1264 to 1954, and now we shall try to relate these to the prices of some of the main articles of consumption. In 1901 Steffen<sup>3</sup> displayed the movements of two wage-rates in comparison with those of the prices of wheat and meat through the preceding six centuries and more: it was his Tafel II that first displayed the striking evidence for a great rise and fall in the real income of the wage-earner between 1300 and 1600, the level reached in 1450-1500 apparently not being regained until after 1860. We shall test these indications by bringing a wider range of prices to bear.

### I

Nowadays, real wages are commonly estimated by comparing money earnings with an index of the cost of living, but there are several reasons why we cannot do that here. On the side of income, all we have is the rate of pay for a day, and we do not know how many days' work the builder was getting in the year from time to time, nor what other resources he had. On the side of outlay, we know little or nothing







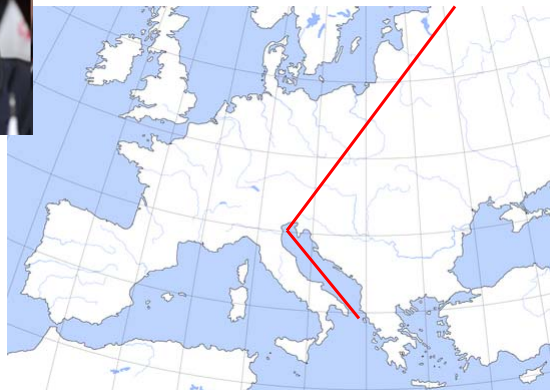
## Why might fertility go up?

- Habbakuk (1953) Rising demand for labor led to rise in births, probably by increasing marriages
- Krause (1958) Economic changes, urbanization undermined traditional constraints on marriage
  - Poor law encouraged early marriage
  - Urbanization increased illegitimacy

## Hajnal (1953, 1965) The European Marriage Pattern: Late Marriage, High Proportions Never marrying



John Hajnal



The "Hajnal Line"

## Homeostatic Demographic Regime

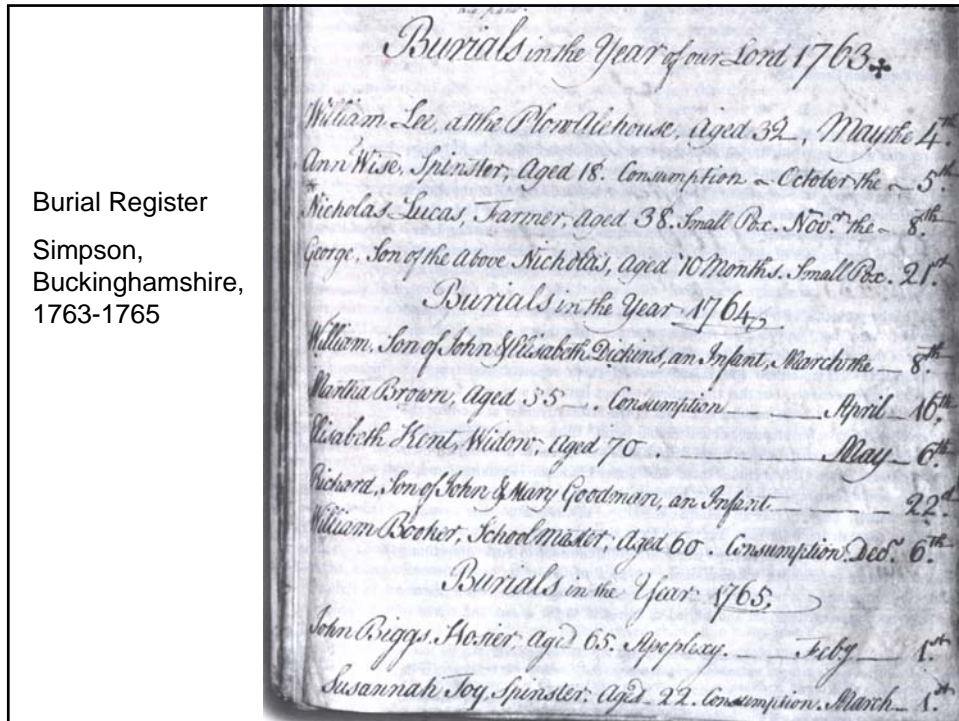
The hypothesis: the traditional European demographic system was self-regulating.

- In good times, marriage age declined and fertility increased.
- In bad times, marriage age was delayed, many women never married, and fertility went down.

## New Data, New methods

- All work before 1966 was based on the same series of data: a count of numbers of Anglican baptisms, burials, and marriages in every Parish once each decade from 1700-1800
- Debates over adjustments for undercount
- Fundamental problem: no denominators, no age distribution, so counts of baptisms and burials cannot yield age-independent measures like TFR or life expectancy

Burial Register  
Simpson,  
Buckinghamshire,  
1763-1765



## Parish Registers

- In 1538, Henry VIII ordered that all baptisms, marriages, and burials be recorded by the parish clergy.
- In 1695, Parliament decided to enforce the rule, and record-keeping became almost universal.

Act of Parliament to improve registration, 1695

( 731 )



Anno Septimo & Octavo

Gulielmi III. Regis.

An Act for the Inforcing the Laws which Refrain Marriages without Licence or Banns, and for the better Registering Marriages, Births and Burials



Whereas by an Act of Parliament made in the fifth and sixth Years of the Reign of his Majesty King William, and the late Queen Mary of blessed Memory, Entituled, An Act for Granting to Their Majesties several Duties upon Velum, Parchment and Paper, for Four Years, towards Carrying on the War against France, It is amongst other things Enacted, That a Duty of Imposition of five Shillings, shall be Rated, Levied, Collected and Paid, for every Piece of Paper or Parchment,

732 Anno Regni septimo & octavo

ment, upon which any Licence or Certificate of Marriage should be Written or Ingrossed. And whereas by a Clause in another Act of Parliament, made in the fifth and seventh Years of his Majesties Reign, Entituled, An Act for Granting to His Majesty certain Rates and Duties upon Marriages, Births and Burials, and upon Bachelors and Widowers, for the Term of Five Years, for Carrying on the War against France with Vigour, It is amongst other things Enacted and Provided, That no Person shall be Married at any Place pretended to be Exempted from the Discretion of the Bishop of the Diocese, without a Licence first had and obtained, except the Banns shall be Published and Certified according to Law: And that every Parson, Vicar, and Curate, who shall marry any Persons contrary to the true Intent and Meaning thereof, shall forfeit the Sum of One hundred Pounds: Which Clause was so Enacted and Provided for the better ascertaining, levying and collecting the aforesaid Duty of five Shillings upon every Licence or Certificate of Marriage, but by experience is found ineffectual for the same, in regard the said Penalty of One hundred Pounds is not extended to every Offence of the same Parson, Vicar or Curate so Offending, as aforesaid. And whereas the Force and Intent of the said Clause is otherwise Eluded and made of none Effect, by several Parsons, Vicars and Curates, who

The Quality of the Parent	Christenings 1702.	The Time of the Childs Birth	The Quality of the Parents
Farmer	Becken Groomer. the Son of Andrew & Sarah. Apr. 18.	March 29.	Farmer
Labourer	Mary Groomer. Daughter of W <sup>m</sup> & Elene. April. 24.	Apr. 5.	Farmer
Shopkeeper	Thomas Smith. Son of John & Eliza. Apr. 29.	April. 29.	Farmer
Farmer	Susanna Day. Daughter of Stephen & Mary May. Apr. 27.	Apr. 17.	Farmer
Labourer	William Newton. Son of W <sup>m</sup> & Susanna. May 30.	May. 27.	Labourer
Farmer	John Napier. Son of W <sup>m</sup> and Mary. June 5.	June 5.	Farmer
Mahyter	Sarah Goulden. Daughter of Tho. & Mary. June. 7.	May. 27.	Labourer
Farmer	Richard Salter. son of Richard and Rebecca. June. 19.	June 19.	Jaylor
Farmer	Elizabeth Lisleby. Daughter of W <sup>m</sup> & Mary. June 26.	June 5.	Farmer
Labourer	James Horards. Son of James & Hannah. June 28.	June 23.	Labourer
Farmer	Mary Horwood. Daughter of Richard & Mary. July. 11.	July 8.	Labourer
Labourer	Randie Bignall. son of Randie & Catherine. Sept. 1.	Septemb. 1.	Labourer
Farmer	James Clark. Son of Thomas & Susanna. Sept. 12.	Septemb. 2.	Warren.
Labourer	George Cander. Son of William & Frances. Sept. 20.	August. 28.	Smith
Minister	Anne Meock. Daughter of John & Anne. Sept. 30.	Septemb. 19.	Farmer
Shopkeeper	William Adcock. son of Henry & Elizabeth. Oct. 9.	Septemb. 23.	

Baptism Register, Iver, Buckinghamshire, 1702

## Louis Henry and Family Reconstitution

1. Find a parish with at least a century of high-quality registration (no major gaps)
2. Copy all the marriages onto special family reconstitution forms, recording the names of bride and groom and the date of marriage
3. Go through each baptism and add the names and birth dates to the form for the parents marriage. If you can't find a marriage form for the parents, make a new one.
4. Go through the burial records and add the dates of death for both parents and children whenever possible.

## Why reconstitute families?

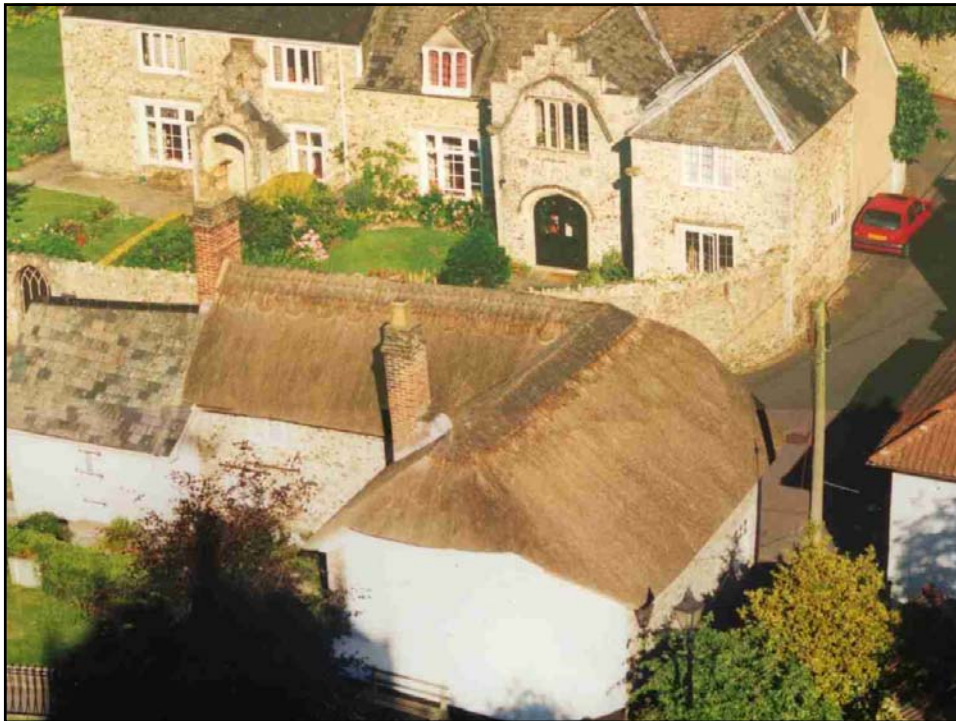
- Henry's insight was that the limitation of parish registers is that they provide numerators, but not denominators
- He thought that the Family Reconstitution Forms would allow calculation of age-specific rates of births and deaths: the reconstituted families themselves would be the denominators

## Colyton and the Cambridge Group



Edward Anthony Wrigley

Colyton, Devonshire



# Family Limitation in Pre-Industrial England

By E. A. WRIGLEY

**M** Louis Henry of the *Institut National d'Etudes Démographiques* in Paris has, by his development of the technique of family reconstitution, placed a powerful new weapon in the hands of historical demographers in those countries fortunate enough to possess good parish registers. By this method any running series of births (baptisms), deaths (burials), and marriages can be exploited to provide a detailed picture of many aspects of the fertility, mortality and nuptiality of a community.

Family reconstitution is in principle a simple operation.<sup>1</sup> Information abstracted from the registers is transferred initially to slips, each event in each register being recorded on a separate slip. This in turn is collated on Family Reconstitution Forms (F.R.F.s) on each of which there is space to record the dates of baptism and burial of the two principals to the marriage, the date of the marriage itself, the names of the parents of the married couple, and, in the lower half of the form, the names and dates of baptism, marriage, and burial of all issue of the marriage. There is also space to record other information about residence, occupation, place of baptism and burial, and so on. Only a small proportion of families can be completely reconstituted in most parishes, but for many purposes partially reconstituted families can also be used. From the F.R.F.s a wide range of demographic measures can be calculated, including such things as age at first marriage, age-specific marital fertility, infant and child mortality, expectation of life (subject to some margin of error), birth intervals, and the percentage of pre-nuptial first pregnancies.

Son <u>Charles Ward</u> 181991				Occupation	
HUSBAND <u>Ward</u> <u>John</u>		Huband's parents' abode <u>Norman</u>		Huband <u>Wm Ward Weaver</u>	
WIFE <u>Vickers</u> <u>Mary</u>		Daughter <u>John Vickers</u> 181999		Huband's father	
MARRIAGE <u>181994</u>		Wife's parents' abode <u>Norman</u>		Wife's father <u>Taylor</u>	
MARRIAGE	MARRIAGE	Date		Remarks	
181994	181994	18 Oct. 1799	13 Feb. 1797	Age at first marriage	Remarks
HUSBAND	WIFE	MARRIAGE	MARRIAGE	Age at first marriage	Remarks
I	I	18 Dec. 1799	13 Feb. 1799	Age at first marriage	Remarks
I	I	20-0-1699	20 Jan. 1799	Age at first marriage	Remarks

Age groups	Years married	No. of births	Age of mother	Inter-val months	Sex	Births		Burials		Marriages		Name(s)	Surname of spouse
						rank	date	rank	date	date	sex		
15-19					π	1	3, Nov. 1790					JAMM	
20-24					F	2	24, Nov. 1792					SAVAN	
25-29					Z π	3	15, Apr. 1794					WILLIAM	
30-34					π	4	12, Nov. 1795					WILLIAM	
35-39					F	5	27, Jan. 1796					MARY	
40-44					F	6	15, Jan. 1796					HENRY	
45-49					π	7	12, Nov. 1796					JANET	1818
TOTAL					π	8	4, Dec. 1790					WILLIAM	
boys					π	9	20, Sept. 1796					SAVAN	
girls					F	10	0-0-1792					MARY	
Remarks													
FR 16 63													

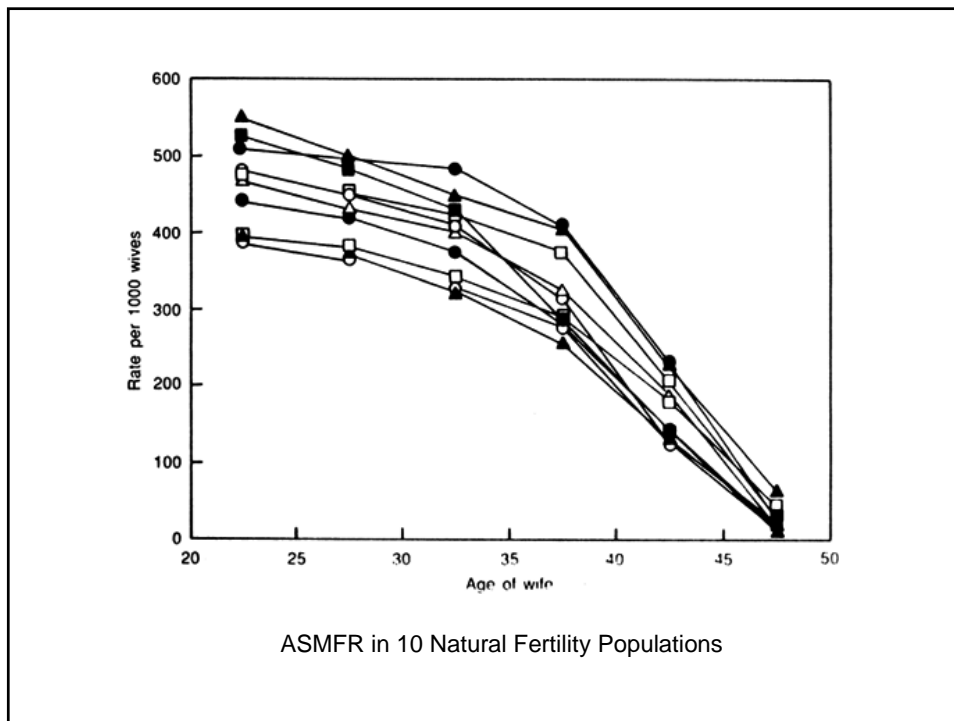
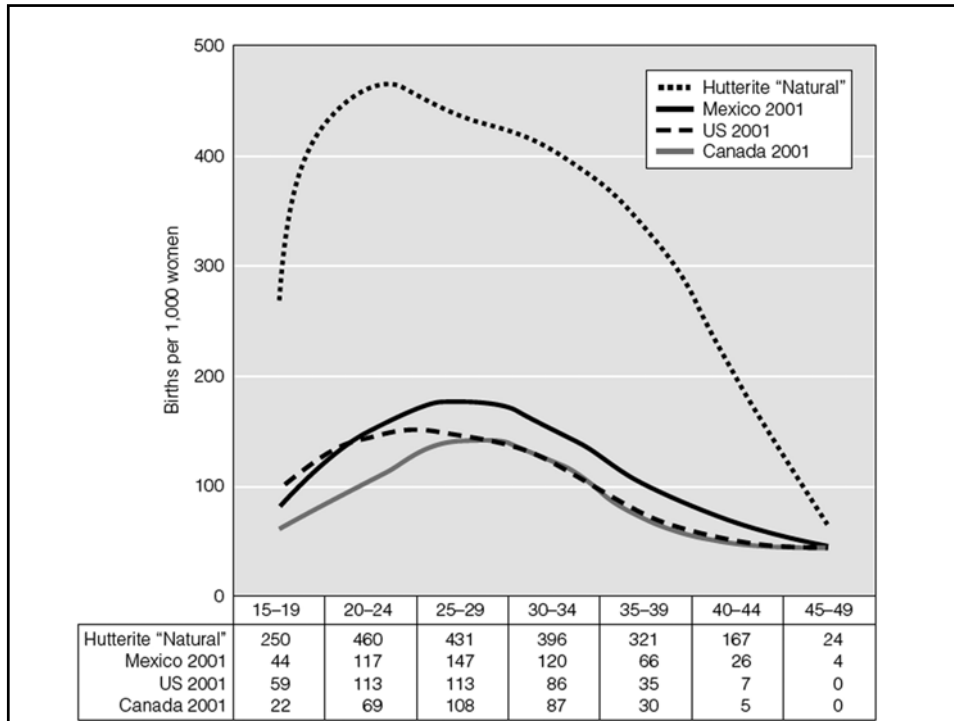


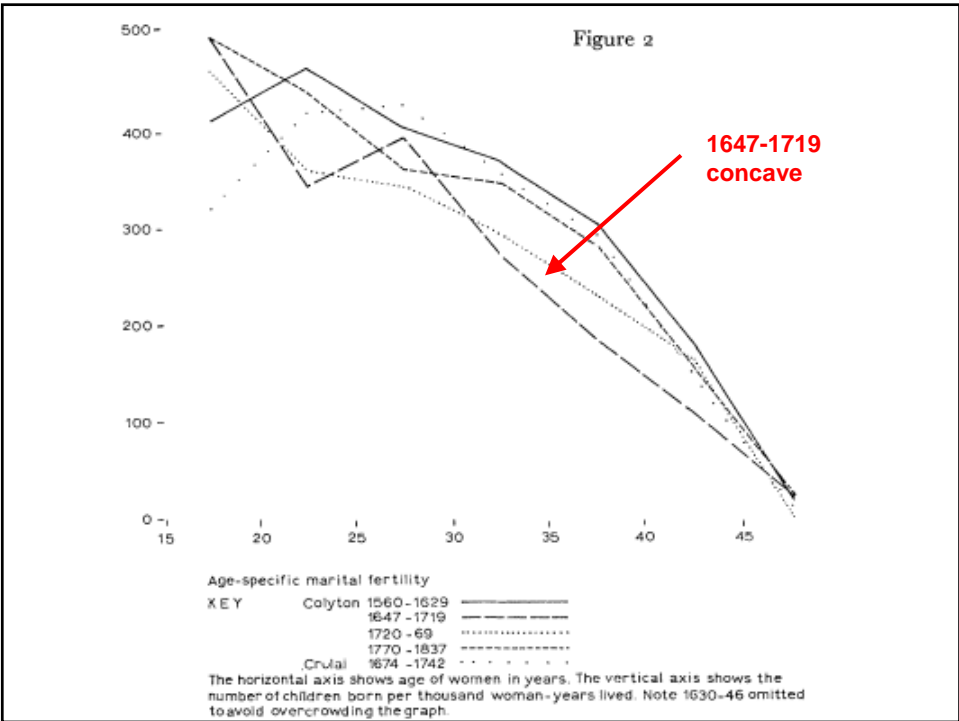
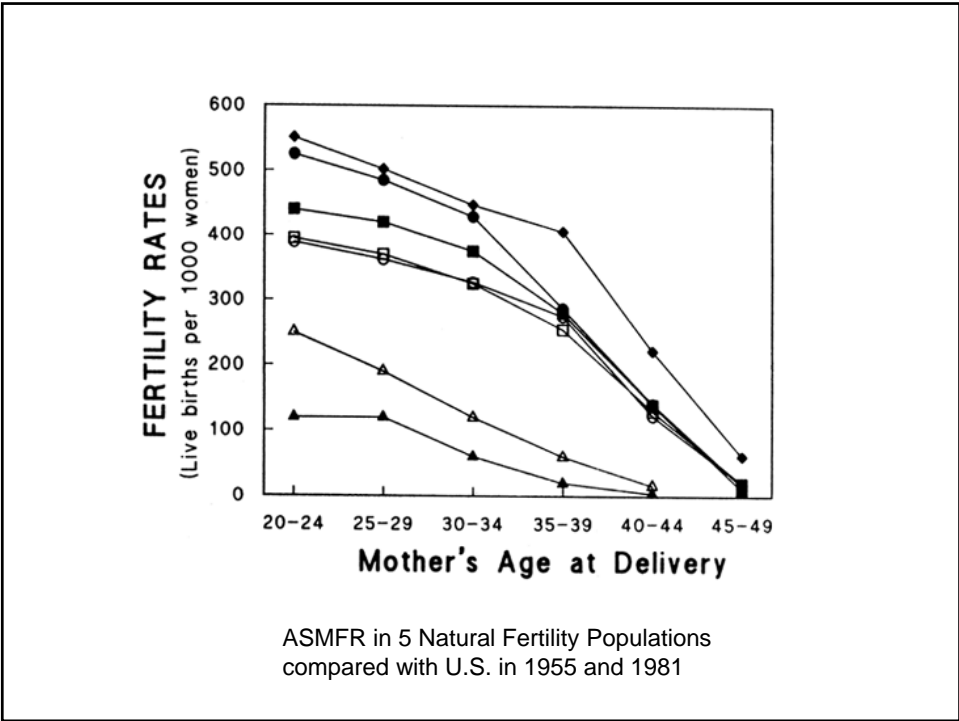
Table 2. *Mean Age at First Marriage*

	Men		Women	
	No.	Mean	No.	Mean
1560-99	73	28.1	126	27.0
1600-29	124	27.4	162	27.3
1630-46	61	25.8	83	26.5
1647-59	38	26.9	48	30.0
1660-99	36	27.6	61	28.8
1700-19	35	28.1	27	30.7
1720-49	55	26.2	58	27.2
1750-69	35	25.0	46	26.3
1770-99	93	27.6	107	26.4
1800-24	67	25.6	100	24.9
1825-37	59	25.9	68	23.3

### “Natural” Fertility







## Effect of Colyton

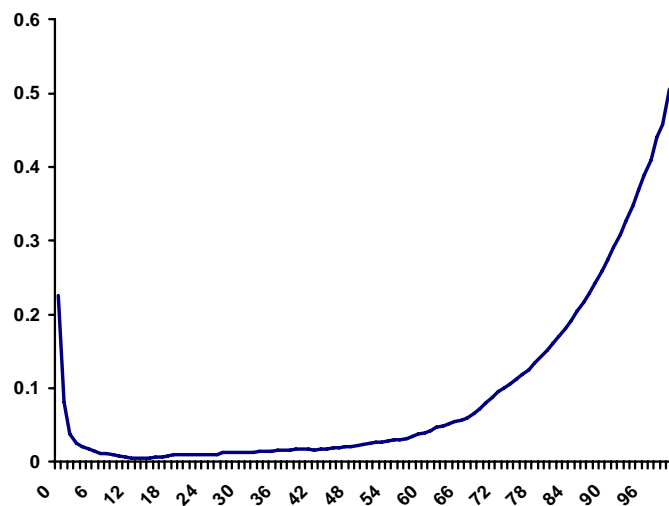
- Controversy over claim of fertility limitation:
  - Birth registration may have been deficient in the middle period
  - Number of cases was very small: no statistically significant deviation from natural fertility pattern
- Larger claim that fertility rise was responsible for population growth was highly influential
- Wrigley decided that a larger study with many family reconstitutions was needed

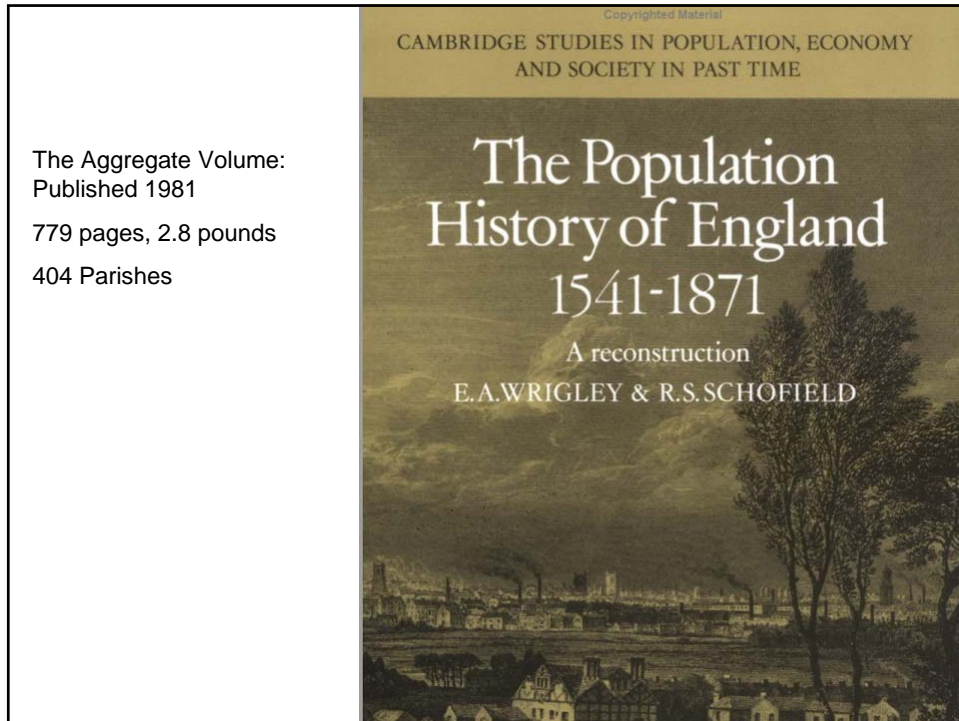
- Organization of the CGHPSS
- Army of volunteers: *Local Population History*
- Automatic family reconstitution would speed processing of many parishes
- Software development became too difficult, project bogged down
- Decided to carry out simpler “Aggregative Analysis” first, do full-scale family reconstitution project later

## Backward Projection

- Estimate number of births, deaths, and marriages in each year
- Starting from a known population (1871), estimate population in each previous year by adding deaths and subtracting births
- Estimate the age distribution of deaths based on known age distribution in subsequent year and standard age pattern of mortality

Typical Pattern of Age-Specific Death Rates





## Conclusions of first Wrigley et al. volume

- England did have a homeostatic regime
- Population revolution occurred because of rising wages, which lowered marriage age and increased fertility

### Firestorm of criticism

- Method was unstable; slight difference in number of 90-year olds in 1871 led to huge difference in population in 1541
- So many complexities and adjustments it is impossible to know what is going on
- The adjusted results seem implausible when compared with the raw results (razzell slide)

### Ronald Lee: The Problem of the Method

"Back projection attempts an impossible task, and can only arbitrarily select one demographic past from among an infinite set of equally plausible and acceptable ones, which are consistent with the input data."

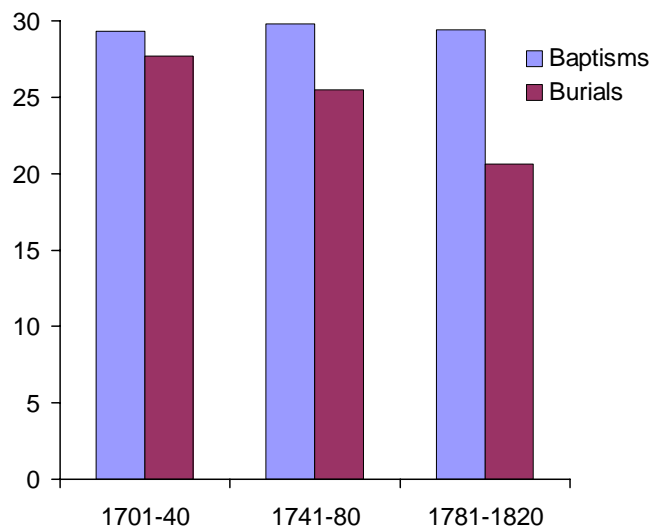
## Razzell: W&S Assume Birth Registration got much worse, but evidence suggests otherwise

**INDIVIDUALS LISTED IN THE 1851 CENSUS BUT NOT FOUND IN THE BAPTISM REGISTER VERSUS THE CAMBRIDGE GROUP'S INFLATION RATIOS**

Period	Percentage Not Found in Register (Razzell) (1)	Period	Wrigley & Schofield's Inflation Ratios (%) (2)
1761-1770	32.4	1760-1769	8.4
1771-1780	27.9	1770-1779	9.3
1781-1790	32.6	1780-1789	13.1
1791-1800	36.0	1790-1799	20.9
1801-1810	32.0	1800-1809	28.8
1811-1820	33.0	1810-1819	38.0
1821-1830	30.0	1820-1829	34.1
1831-1834	27.4	1830-1839	26.0

*Sources:* Razzell, "The Evaluation of Baptism," p. 129; and Wrigley and Schofield, *Population History*, p. 561.

## Razzell: Crude Baptism and Burial Rates from W&S Data, without assuming decline in completeness of baptism registration





## Ultimate success

- Despite criticism, the *Population History* became the standard interpretation
- The leader of the group, Tony Wrigley, received a knighthood for his efforts, was awarded a gold medal by the IUSSP, and was elected President of the British Academy



**Sir Tony**

The Reconstitution Volume:  
Published 1999  
657 pages, 2.2 pounds  
26 Parishes

ENGLISH POPULATION  
HISTORY FROM FAMILY  
RECONSTITUTION  
1580–1837

