

## SOME ASPECTS OF E.A. WRIGLEY'S

### "POPULATION AND HISTORY" (1)

J.D. Chambers

David Chambers is Emeritus Professor of Economic and Social History at the University of Nottingham. He has devoted many years to the study of vital aspects of economic history, particularly agriculture, industry and population. His pioneer study The Vale of Trent (Economic History Review, Supplement No. 3 1957) demonstrates the vital role of demography in the economic history of a specific region. He is currently engaged in a study of pre-industrial population trends.

Dr. Wrigley achieved an assured place in the development of British historical demography by his article on Colyton, and his new book Population and History will go far to enhance it. Here at last is a cheap, well-illustrated and clearly presented study of the technicalities of population change from pre-industrial to contemporary societies, written with the author's well-known clarity and economy of style and mastery of detail. It is mainly concerned with the inter-relationship of fertility and mortality and various associated social and economic factors at different historical stages, but it also includes, as part of the explanation of the pre-industrial demographic situation in England, a theoretical element that Dr. Wrigley first developed in the famous Colyton article and that (I suggest) may prove to be the most interesting contribution to demographic discussion since Malthus.

He describes it as a process of "homeostatic adjustment" through control of fertility to achieve an optimum equilibrium between population and subsistence; and he also suggests that this is one of the factors that favoured the progress of England in her advance towards industrialisation. It will be seen that he has written a monograph that breaks new ground on the ideology as well as the technology of population study, and one that will prove of inestimable value to teachers and students everywhere, not only to those who are primarily interested in pre-industrial demography but to those who are trying to find their way through the intricacies of population change in the transition to industrial societies and through the intimidating problems of the modern world.

I do not propose to attempt to review a book of such scope and complexity even if I were capable of doing so: but I think that it may

be possible to indicate some of the issues it raises and sometimes the difficulties to which it gives rise, at least in regard to its treatment of pre-industrial population problems; but the section on the demography of modern industrial states and of the contemporary world must be left for separate treatment on some other occasion and to a more expert hand.

Perhaps the most noticeable feature of the earlier chapters is the author's penchant for disposing of some of the more familiar examples of mono-causal explanations of complex demographic events and situations. In his discussion of the factors that affected the size of pre-industrial population, for instance, he notes that "it is naive to treat the demography of a society as a result of its economic constitution, as a dependent variable which can be read off from the economic functioning of society once that is known [or] that population growth always waits upon an advance of technique". (p. 49). One can only hope that these weighty words will not go unheeded in those quarters where population growth is regarded as, of necessity, a function of food - and/or - employment opportunities.

Those who are tempted to speculate on the reason for earlier marriage and higher birth rates in the period of transition from modern demographic conditions should not omit to take into account Dr. Wrigley's warning on the complexity of the variables involved. He makes a brilliant analysis of the situation in the three German centres of Arnsberg, a coal area, Pomerania, entirely agricultural, and Berlin, primarily administrative, taking into account sex ratios and religious affiliations as well as the conventional factors of wages and conditions of work, and concludes "the whole argument from levels of wages to early marriage is too crude to be acceptable unless it is considerably amplified. It was the total environment in which men and women lived rather than the simple level of wages or even a combination of wage level and employment expectations which influenced decisions to marry". (p. 158).

It would be interesting, indeed the temptation is almost irresistible, to follow him through his references, direct and indirect, to Malthus: but I will content myself with two examples. He points out that Malthus chose to cast his argument with special reference to food supply, not to goods and services, which helps to explain why he is a less appropriate guide for the study of post Industrial Revolution societies than traditional ones; and secondly, that as a result of the new supply of goods and services made possible by the Industrial Revolution "the old cut-off which bedevilled industrial expansion in the

past when demand lost impetus as real wages fell due to population pressure and declining marginal returns in a land orientated economy was eliminated". (p.179). Whether there was such a "cut-off" in England after the crisis of the 13th century would form an interesting debate. Dr. Wrigley implies that a situation of this kind emerged in the late 16th and early 17th centuries, but, as his study of Colyton shows, the check to fertility that might have been expected did not come until later, and one wonders what are the criteria for deciding the character of a situation of this kind in the absence of acceptable figures of national income. However, I think he may be right in suggesting we have here a Malthusian situation even though demographic variables do not seem to have behaved in the prescribed Malthusian way.

He shows also that a sudden rise of mortality in pre-industrial populations is not necessarily evidence of over population, or a sign of Malthusian crisis; it may be simply the fortuitous effects of epidemic outbreaks. These, together with crises of subsistence, he suggests, account for the see-saw motion of pre-industrial population movements from mortality crises to baby booms with effects on age structure which are illustrated through a demonstration of Sundt's Law, a demonstration which readers of this journal may find particularly enlightening. (p.69-71).

It is the essence of Dr. Wrigley's case, however, that pre-industrial populations did not adhere strictly to any prescribed pattern "or law" of change, and Colyton, to which he refers from time to time, is a supremely interesting case in point.

It might have been expected that a baby boom, as required by the Sundt Law, would follow the attack of plague in 1645/6 in which one fifth of the people of Colyton died; on the contrary, the age of marriage rose, fertility and expectation of life fell, and Colyton faced a demographic depression for a period of 70 years. This is explained by Dr. Wrigley as an example of the insensitive adjustment between population variables and economic conditions involving a time-lag in the "lurch" that the population might be expected to make in its efforts to establish homeostatic balance between numbers and the means of life. If the population of Colyton had reflected sensitively the changes in real income "the average age of first marriage of women should have tended to rise during the 16th century as population grew. After the middle of the 17th century the average should have tended to fall again. In fact, matters turned out quite differently". This strange response to improving economic conditions was

accompanied by a rise in the death rate: "both the schedule of fertility and mortality in Colyton changed. They changed in a way that accentuated each other's effects on the balance of births and deaths". I should hasten to add that Dr. Wrigley does not suggest that this was anything more than a coincidence, but a reader who finds there is some ambiguity about this should be forgiven in view of the footnote to the article on Colyton (Economic History Review, April 1966, p.102), in which he says "several other [my italics] causes of child mortality can be envisaged. It may be, for instance, that smallpox was both more virulent and widespread than earlier". Elsewhere he refers to the suggestion of J.D.B. Durand that there was an exchange of infectious diseases between continents following the triumphs of European navigation and the subsequent rise in death rates everywhere (Daedalus Spring 1968), which is clear indication that Dr. Wrigley is in no danger of underrating the strength of epidemic disease at this time.

I think this factor is worth further elaboration, however, as it may have had wider repercussions than Dr. Wrigley is willing to allow. Creighton gives details of the deaths from smallpox and measles showing a marked rise in London in the 1630s and the still higher levels after 1647 (vol. 1, pp.465-6). The period also includes attacks of plague (though not apparently at Colyton), culminating in the crowning horror of the Plague of London in 1665; and what was happening in London could scarcely fail to happen elsewhere. It was the ideal breeding ground of every kind of infection; and it is well known that disease requires a specific concentration of the poison-carrying bacilli to reach epidemic proportions. London, with its nearly half a million inhabitants, could provide just this, and through its network of exchange along the inland trade routes it could also provide the ideal mechanism for infecting the greater part of the nation. Certainly Colyton was apparently free from plague; perhaps genetic immunity had done its work after the succession of onslaughts from the 1630's to 1647: but it would not be immune from the contents of the Pandora's box that were unloosed after the disappearance of the plague in 1666 - "an enormous increase of various fevers", to quote Creighton, "as well as smallpox ... a new kind of epidemic history which characterised England from the Restoration and the Revolution down to the end of the 18th century" (sic). It included besides smallpox: typhus, influenza, diphtheria, malarial ague, spotted fever, relapsing fevers, dysentery. These were not new, of course; but in the 20 years after 1665 they came down "like rain through a leaky roof" as the author of *Piers Plowman* wrote of the successive epidemics after the Black Death. Some villages lay off the trade

routes, like Hartland (which was also "surrounded on two sides by the sea, and almost entirely agricultural") (p.71), and therefore were relatively free from these attacks. But there is no reason to think that Colyton was so fortunate: certainly Exeter - 30 miles away - was not, as Mr. Pickard's much neglected study of epidemics in Exeter shows; and from 1664 to 1676 the pattern of mortality of the two centres is suggestively close, though Colyton appears to have escaped the fierce onslaught of typhus which afflicted Exeter in the 1680's.

No doubt Dr. Wrigley would have reason to complain that this is beating at an open door and that there is no need to remind him of the fortuitous effects of epidemic disease as a factor in rising mortality at Colyton as elsewhere. I wish to give it greater emphasis, however for another reason: namely because I think it could conceivably have effects which help to explain the strange phenomenon of the fall of fertility when the physical conditions of life were improving. This suggestion is perhaps not so bizarre as it sounds. In the century after the Black Death the phenomenon of a high death rate side by side with a low birth rate has long been noted; and we do not have to go further than the leading contemporary writers for a clue to the explanation. Not only plague but dysentery and fevers of all kinds fell upon the people of the time: "fevers and fluxes, agues and frenzies, boils, botches, foul evils, pokkes and pestilence", to quote Creighton's summary of the author of Piers Plowman. The writer of the English Chronicle is quoted as saying that "women who survive remain for the most part barren during several years", and there is talk of a general demoralisation. Professor Sylvia Thrupp in an important article some years ago perhaps rightly ignores these reports when she turns the clinical eye of the demographer on the scene, but through the stark figures of replacement rates, she can discern a mood that may reflect them. "To the extent that [post-plague] migration was aimless, or motivated by fear, despair, desire to enter the Church or otherwise evade facing responsibilities, we have a cultural" [as distinct from a Malthusian] "interpretation"; and she closes her remarkable article on the fall and recovery of replacement rates in the century following the Black Death with the suggestion "now that medical science is learning so much about bacterial and viral mutation, historians should be prepared to consider this as a factor in the situation. New types of infection are always dangerous ... The period from 1349 to the 1470's, if it was a golden age, was the golden age of bacteria". (Economic History Review, August 1965, p.118).

That fertility can be affected by psychological conditions - above all conditions of insecurity - has been demonstrated by the experience of

the 1930's when the threat of unemployment (and Nazi bombing) hung over the lives of parents and their present and future children, but that it can be advanced as a factor in the situation in the later middle ages is one of the more remarkable manifestations of the new demography. M. Chevalier would go further. He writes of "the generally recognised effects" [of political events] "and even of revolution on fertility" and cites with approval Tocqueville's view that the French Revolution was a cause of lasting social and demographic disturbance in France (Population in History, Glass and Eversley, p.74 passim)(2). That is not to say that the control of fertility was never used to raise the margin between subsistence and the food base under conditions of static agricultural techniques; Professor Herlihy in his article on Pistoia has given a remarkable demonstration of it in action. (Economic History Review, August 1965). But on this occasion it was applied at the height of the Malthusian crisis before the Black Death; and the fall of the birth rate as a result of its application after the Black Death was even more dramatic. But in the case of Colyton "there is no reason to think that in England living standards had reached a nadir in the late 17th century" as Dr. Wrigley himself says; on the contrary it was steadily moving away from it. The crisis in public health, however, might well have reached a nadir; the years following the fearful outbreak of plague (and spotted fever) of 1625 in London were particularly fatal in Plymouth and along the south coast of Exeter; and as Creighton says "we are now coming to the period of the beginning of ship's fever, i.e. typhus". It helped to ruin Buckingham's expedition to Cadiz and spread in the wake of the disease-ridden sailors along the coast. In 1626 the plague also was rife in Devon. It broke out again in 1630 and again in 1635, 1636, 1637: at the same time attacks of typhus and spotted fever were reported from Hampshire to Wales including "a very epidemical attack in Somerset so that many whole families died". Then came the crowning disaster of 1645-7 when Colyton itself was under attack, and a quarter of the people died. Have we here a parallel to the situation described by Professor Thrupp when fertility failed to respond to the opportunities of rising living standards "in the golden age of bacteria"? Is it a response to insecurity and despair rather than to prudential calculation related to the standard of living, as Dr. Wrigley assumes, which was already rising?

One further question suggests itself. It will be remembered that Dr. Hollingsworth also found a similar tendency towards falling fertility among the wives of the aristocracy over much the same period, and a rise in death rate of those under 50. Are we to suppose, by analogy, that they too were acting under Dr. Wrigley's rubric of "homeostatic

adjustment" to bring about a favourable balance between population and available resources? Hollingsworth himself describes the phenomenon as "beyond historical explanation"; but he notes that the French aristocracy were doing much the same thing. Until we know more about the psychological effects of insecurity brought about by incessant attacks of disease I think we should not close our minds to the possibility that Colyton belongs to the same category.

One of the most pleasing and also most pregnant aspects of the book is the treatment of English and continental patterns of growth on the eve of the great population breakthrough in the late 18th century. He brings out clearly the much neglected fact that both England and the Continent were equally affected by the surge of population growth in the second half of the 18th century and that it was not until the end of the period and the early part of the 19th century that England was, as he puts it, "at the head of the pack". He moves easily from Eastern Europe to the village of Hartland in Devon and notes that, in both, the mid-years of the 18th century were equally significant in marking a turning point in the upward movement. Of Hartland, he says, it was not until many years after the sudden appearance of a surplus of baptisms that the village underwent any noticeable change, an example which, he says, makes it less easy to accept the view that "nascent industrial growth preceded population change even in areas close to the new centres of population " (p.156): a further nail in the coffin of the economic determinism of population growth.

Dr. Wrigley also goes on to say that the rise in fertility which he notices in the late eighteenth century was usually preceded by a fall in mortality, a fact which he attributes to the almost complete elimination of the crises of the old type, whether brought about by harvest failure or the independent operation of epidemic disease. The responsibility for this fundamental change in the underlying pattern of mortality he attributes to the widening of the food base through the development of agriculture (including potato culture) and transport; but two questions immediately present themselves for consideration to those who have studied this aspect of the problem: (a) was not the food base even wider per head in the earlier part of the century when England had a substantial surplus of grain for export and for the manufacture of gin but also a stagnant population? (b) are we to presume that Eastern Europe was as advanced both in terms of agricultural progress and in transport facilities to distribute agricultural products as was England? The astonishing rate of growth in East Prussia and Pomerania (not to mention the incredibly high rate of growth of Hungary, far higher than that of England), calls for explanation. In the absence of a

demonstration that these areas were similarly fortunate in the widening of the food base we must presume that the essential factor in these cases was "the independent operation of epidemic disease".

Here Dr. Wrigley touches on an area that few have so far ventured to explore. Why did epidemic disease enter on its decline from 1750, independently of any extraneous environmental influences? One lead has been given which we could wish he had followed up. In the Conquest of Plague, L.F. Hirst presents a learned discussion on the subject of mutation as a factor in the decline of plague, and after discussing the importance of the ecological situation represented by the emergence of the brown rat as the predominant species he goes on to talk of the mutation in the flea (Xenopsylla Cheopis) which carried the plague bacillus: "The change of rodent species by itself (i.e. from black rat to brown rat) therefore cannot account for the failure of the disease to spread actively among the rural and urban European rats. When however the change of rat species is associated with the change of flea species we have an adequate explanation of the relative immunity of Western Europe from plague in modern times". (L.F. Hirst, Conquest of Plague, 1953, p. 338).

We may presume that this example of biological mutation in the flea species would affect the population of Eastern as well as Western Europe, and that it can hardly be irrelevant to the phenomenon of population growth wherever the plague had left its mark in earlier years. Perhaps M. Henry had this beneficent natural process in mind when he wrote "we still do not know whether the reduction in [demographic] disasters was produced by man, the result of economic progress, or whether it was just a piece of good luck, the continuation of which was made possible by the undeniable progress of a later period". (Glass and Eversley, Population in History, p. 448). The element of "good luck" does not play any part in Dr. Wrigley's elegant system of model building, but the subject of genetic immunity and mutation in human beings as well as in the animal and insect world is, I would suggest, of profound significance in shaping the pattern of demographic history and is worthy of more attention than it has yet received.

After all, it was nature, not man, that turned the tide of mortality by the reduction of plague to quiescence through the mechanism of mutation. Man's contribution was more indirect: through enclosures and drainage he diminished malarial ague as a side-effect of raising the food base; through the substitution of brick and tile for stud and mud and thatch, he contributed to the departure of the black rat;



through the improvement of domestic utensils that could easily be washed, and above all through the substitution of cotton clothes that could be boiled, for quilted woollens and leather stays that were worn until they dropped to pieces, he contributed to the defeat of the typhus bug. More directly, he contributed by imitating the immunising processes of nature in the form of inoculation and vaccination. Without knowing it, man was working in conjunction with the forces of nature to bring the great killers under control; but the greatest of all, plague, had been dealt with before man took a hand. As M. Henry says, "it may have been just a matter of good luck". Indeed, it could be argued (in the style of Boserup: The Conditions of Agricultural Growth) that widening the food base may have been the result rather than the cause of the general change in the rate of population growth.

Finally there is one area of doubt on the factual side that only time and the data lying in embryonic form in the belly of the computer at the Cambridge Centre will eventually remove. In his diagram of population movement in England Dr. Wrigley has only one period of sheer stagnation: roughly 1650-1750 (see Dia. 3.3, p.78). This is a remarkable state of affairs in view of the upward movement of the economy and above all of agricultural output and improvement of transport. Are we to imply that the Colyton model of homeostatic adjustment is applicable to the country as a whole during this period? This involves a radical departure from the usual assumption of high birth rates in the first half of the century, and it would have been helpful if Dr. Wrigley could have found space in his tightly packed book to take this discussion a stage further. Certainly we have to note some substantial exceptions to the assumption of stagnation especially in the Midlands and the West. A student of the various parish register series that have appeared has expressed astonishment at the evidence of the growth of population in the last years of the 17th and the early years of the 18th century which they provide, and he concludes "either that the English population increase was very rapid in the early years of the century ... or that the localities on which the series are based diverged in an extraordinary manner from the general pattern". (H.C. Pentland, Population and Labour Supply un-published paper given to the Economic History Conference at Munich in 1965, p.7). He especially draws attention to the remarkable growth in the Nottinghamshire villages and to the observation of Dr. Eversley that in regard to the Worcestershire villages the years 1695-1705 "exhibited the highest baptism rate of the whole series and the largest absolute natural increase of any period before 1775" (quoting Eversley, Population Studies, March 1957, p.263). There is reason to think that urban growth was also taking place on a considerable scale, e.g. in

Nottingham, Leicester, Birmingham, Manchester, Liverpool; and since urban growth at the time was mainly a function of migration rather than of natural increase, it may be presumed that we must look to the surplus of the countryside as the source from which this expansion - like that of London - was fed. That this was the case in the Midlands appears to be established by the published parish register series; and a "spot-check" of 16 Lancashire parishes made possible by the kindness of Dr. Wrigley himself<sup>(3)</sup> reveals a similar pattern of surpluses beginning in the late 1690's and ending about 1720.

We are reminded that Dr. Tucker has raised the possibility of a "rate of natural increase at the beginning of the 18th century already [his italics] nearly as high as that obtaining during the vital revolution itself". (G.S.L. Tucker, English Pre-Industrial Population Trends, Economic History Review 2nd series, XVI 1963, p.218) and Professor Youngson has argued forcefully for raising population estimates of England during the period (Population Studies, 15.1961). In the light of these deviations from the Colyton model, I feel Dr. Wrigley's assumption of a general stagnation between 1650 and 1750 is open to question and that the national pattern may have taken a very different course. Until the computer at Silver Street has delivered its portentous progeny we cannot be sure. We can only hope that in the competent hands of the resident mid-wives, Dr. Wrigley and his colleagues, the delivery will be safe and not too long delayed.

In any case, the significance attributed by Dr. Wrigley to the pause in population growth after 1650 remains unimpaired. He regards it as a "lurch" to slower growth which was characteristic of the pattern of population growth in pre-industrial England, and which performed an important role in preparing the ground for the Industrial Revolution. It provided a period of growing per capita saving and rising standards: he quotes Professor John's statement that "expectations" [of improved standards] of most classes in England increased permanently in the century after the Restoration", and adds "certainly population increased very little in the period while living standards were rising". In other words, the potential of the domestic market was rising and providing a stimulus for the expansion on all sides that came with the upturn of population and agricultural profits after 1750.

With this general thesis there can be no quarrel. The only modification I would suggest is that the period of stagnation was broken by a substantial compensatory surge of population following upon the period of epidemic crises in the post-plague years - "a new kind of epidemic history", as Creighton says. The "compensatory surge" appears to

have been followed by another check as a result of the epidemics 1720-40 followed by another upward movement to 1770-1780 when the demographic revolution really got under way, owing, I would suggest, to the taming of the great killing diseases. Dr. Wrigley has strengthened the hands of those who see the Industrial Revolution as a response to potential demand made actual by the return of demographic growth and agricultural prosperity; but he has left the problem of the actual pattern of population movement during the crucial period unresolved. As an unrepentant disciple of the Tucker thesis of compensatory cycles, including a powerful one at the beginning of the 18th century, I think it would be unfortunate if Dr. Wrigley's omission to consider it should be taken as a signal to consign this fruitful idea to limbo in the discussion of pre-industrial patterns of population change; but the gratitude of all students of the subject must go out to Dr. Wrigley for keeping the subject so vibrantly alive.

This, of course, is a wholly inadequate treatment of Dr. Wrigley's masterly survey. His book is deceptively small in size but encycloaedic in content; and to do it justice would require an expertise in demographic study which I do not possess. For those interested in the earlier phases of demographic history - as I imagine most of the readers of this journal are - it is replete with vital ideas and indispensable data, and for this alone the book will stand as a landmark in English demographic history. As for the study as a whole, it will probably put English demographic historiography at the head of the field, a pre-eminence that it has not enjoyed for a very long time.

Perhaps I may add that this article is intended rather as the beginning of a discussion than a review, and I hope readers will take it up, correcting its errors and supplying shortcomings where these are necessary in future issues of this journal.

#### NOTES

- (1) E.A. Wrigley, Population and History, World University Library, Weidenfeld and Nicolson, London, 1969, 16s.
- (2) Dr. Wrigley puts a different complexion on this argument by relating it to comparative living standards at different social levels. (see p.191) but whether this interpretation would be wholly compatible with Mr. Chevalier's view seems to be debatable.
- (3) I would like to take this opportunity of expressing my sincere thanks to Dr. Wrigley for placing facilities and resources of the Silver Street Centre at my disposal for this purpose.