

Demographic Transition Theory*

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Demography is a science short on theory, but rich in quantification. In spite of this it has produced one of the best-documented generalizations in the social sciences: the demographic transition.

The 50 years of *Population Studies* roughly cover the period in modern demography in which the demographic transition has been a leading topic. By convention, Frank Notestein's article published in 1945¹ is regarded as its first definition, although Notestein did not refer to his generalization as a 'transition';² the first to use this expression was Adolphe Landry in his book entitled *La Révolution Démographique* which was published in 1934.³

What is demographic transition theory? Stripped to essentials it states that societies that experience modernization progress from a pre-modern regime of high fertility and high mortality to a post-modern one in which both are low. The term 'modernization', is not defined, nor does it include the crucial questions about causation that form the subject of much modern demographic literature.

For some, transition theory lies at the centre of modern scientific demography. Demeny has called it 'the central preoccupation of modern demography'.⁴ To others it is a non-theory to be dismissed as an unproven generalization unworthy of much discussion.⁵

THE FORERUNNERS

The demographic transition model began as a classification of populations differentiated by different combinations of fertility and mortality. The first formulation in the English demographic literature is that by Warren Thompson, published in 1929.⁶ He specified three types of countries with different rates of population growth. The first (Group A) were those with falling rates of increase and which were facing potential population decline. Although mortality in these countries was low, their rapidly declining fertility presages first a stationary, and later a declining population. Included in this category were the countries of Western Europe and overseas countries which had been settled by immigrants of European origin.

Group B consists of countries in which both birth and death rates had fallen, but where death rates had declined earlier and more rapidly than birth rates. As a result their

* Helpful comments from Ansley Coale, Charles Hirschman, and Chris Wilson are gratefully acknowledged.

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¹ Frank Notestein, 'Population: The long view', in T. Schultz (ed.), *Food for the World* (Chicago, 1945) pp. 36–57. Though, as noted later, it is not, in fact, the first statement of the theory.

² Kingsley Davis referred to the transition in a publication that he edited which was published at the same time as Notestein's article. K. Davis (ed.) 'World population in transition', *Annals of the American Academy of Political and Social Science*, 237 (1943), especially the first chapter written by himself.

³ A. Landry, *La Révolution Démographique*, (Paris 1934).

⁴ P. Demeny, 'Early fertility decline in Austria-Hungary. A lesson in demographic transition', in D. V. Glass and R. Revelle (eds.), *Population and Social Change*, (London, 1972).

⁵ Cf. D. Coleman and R. Schofield (eds.), *The State of Modern Population Theory. Forward from Malthus*, (New York, 1986), especially the introduction.

⁶ W. S. Thompson, 'Population'. *American Journal of Sociology*, 34 (1929), pp. 959–975.

populations were growing very rapidly, until falling birth rates would bring about a stationary, and then a declining population. Included in this group were the countries of Eastern and Southern Europe. Thompson pointed out that their demographic situation was comparable to that of countries in Group A some 35 to 40 years earlier. But since death rates were now falling more rapidly than in the past, rates of natural increase in this group were greater than those experienced earlier in countries in Group A.

Countries in Group C in which neither birth nor death rates were under control were classified as 'Malthusian'.⁷ Thompson suggested that this group contained between 70 and 75 per cent of the world's population. But because data were generally sparse, he confined his analysis to three large countries in which data were available: Japan, India and Russia. He found some evidence of change in Japan, but little in either India or Russia. He predicted that population growth in Russia would be much larger than in India, because of its much larger resource base. He thought that it would take three to four decades, before many of the countries in Group C entered Group B. A good forecast!

Thompson's rough forecasts of early population decline in Group A proved to be in error because he projected birth rates to decline linearly. He predicted that dire political effects would result from existing demographic trends:

'Is it probable that peoples in Groups B and C will sit quietly by and starve while the Group A countries enjoy the lion's share of the good things of the earth?'.⁸

However, he did present the transition as a continuing global generalization.

Though Thompson continued to warn of the consequences in many of his subsequent writings, he did not carry his typology further. In the several editions of his popular text on population problems he did not use this typology, nor did he refer to the transition as such. In his chapter entitled 'Some population theories since Malthus' his typology and the transition are not even mentioned! Apparently Thompson thought that neither could be described as a theory.

Rather surprisingly, Thompson's typology was not taken up in the English demographic literature for some 15 years. This is curious, because in 1934 Landry had published *La Révolution Démographique*, in which he developed the same basic ideas as Thompson though he did not appear to be familiar with his work.

Landry, too, postulated three stages of population development: primitive, intermediate, and contemporary, roughly equivalent to Thompson's three groups. In a section entitled '*En quoi a consisté la révolution démographique*',⁹ he, like Thompson, forecast that the new regime would spread throughout the world. In his view, it had already 'conquered' all the European countries, as well as some distant (i.e. overseas) countries. 'Far from being absurd there are reasons to think that it will eventually take over the entire world'. He also predicted that in the 'new' countries in which the transition came later, declines in both birth and death rates would be faster.

Landry provided a much fuller explanation than Thompson of the reasons for the decline in mortality and fertility. Modern mortality decline was unprecedented in human history. It is much easier to explain than fertility decline: the reduction of epidemics by vaccination and better hygiene, improved diagnosis and treatment of disease, reduction of famines, fewer deaths from violence and civil wars, reductions in infant mortality, and

⁷ 'Population inevitably increases when the means of subsistence increase.' (T. R. Malthus *An Essay on Population*, Vol. 1 (1826). p. 314 in the edition published in London in 1972.

⁸ *loc. cit.* in fn. 6, p. 975.

⁹ Landry, *op. cit.* in fn. 3, pp. 45-55.

improved standards of living all played a part. He did point out, however, that reduction in mortality could now be achieved without any improvement in material welfare. A strikingly modern analysis!

Like everyone else, Landry found fertility reductions harder to explain, except in the proximate sense of the increased use of contraception. He brushes aside notions that the decline was due to physiological factors or to moral corruption, and presents evidence that 'birth restriction' (he did not like the word 'control') was in general use in France as early as the latter part of the eighteenth century, and thus raised an issue that has not yet been fully resolved in discussions of the transition. When did it begin? In Western Europe, both fertility and mortality began to decline long before the last quarter of the nineteenth century, the date generally quoted for the beginning of the transition.

What is the motive for birth regulation? Landry believes them to be largely 'egotistical': the cost of children, their ability to cause pain and distress to their parents, the limitation of parents' activities and relaxation, and, of course, the problems women experience in pregnancy and child care. His analysis preceded much of the later discussions of individualism and 'self-fulfilment' as a cause of declining fertility.

Landry was particularly concerned with conditions in France, where birth rates and population growth had been lower than in neighbouring and rival countries for a long time. His concern is indicated by the title of the companion piece to his book: *Dépopulation et Décadence*. Unlike some later authors, Landry did not see the contemporary regime as a new equilibrium of births and deaths at a low level, but as a situation in which the population of Europe was facing decline in spite of prosperity. Like Thompson, he regarded this situation as favouring invasion by foreigners by peaceful or warlike means. He believed that this process had already begun in France, and attributed the decline of Greece and Rome to depopulation.

Another forerunner was A. M. Carr-Saunders. His book *World Population: Past Growth and Present Trends* was published in 1936, and contained a long discussion of what came later to be called the demographic transition in specific countries. He did not formulate a general theory of the transition but presented his data and discussed the 'small family system' and its causes at length. His is a massive, but surprisingly readable compendium of materials relating to population size and demographic change in many countries. But because data for non-European populations were limited his examples were mainly confined to Europe and overseas countries with populations of European background.

THE DEMOGRAPHIC TRANSITION THEORY

The demographic transition theory was formulated by the Office of Population Research in Princeton as a culmination of or abstraction from previous work on *The Future Population of Europe and the Soviet Union*, which was published in 1944 on behalf on the League of Nations.¹⁰

Though he was by no means the first to state the essentials of the theory of the demographic transition, Notestein's early formulation is conventionally accepted as classic. He was apparently unaware of Landry's work, and perhaps also of Thompson's. Perhaps, like Thompson himself, he did not initially think of his formulation as a theory. He stated that his discussion owed much to Carr-Saunders's compilation of data and his

¹⁰ F. W. Notestein *et al.*, *The Future Population of Europe and the Soviet Union: Population Projections, 1940-1970* (Geneva, 1944). Parallel works published by Princeton University Press were W. Moore, *The Economic Demography of Eastern and Southern Europe* (1945); D. Kirk, *Europe's Population in the Interwar Years* (1946); and F. Lorimer, *The Population of the Soviet Union: History and Prospects* (1946).

discussion of demographic processes. Though not completely original, Notestein's statements are lucid and sharply focused. In his initial article (1945), he presented a typology of populations as an introduction to a review of the prospects for world population growth. His three types are closely parallel to those of Thompson (1929), and Landry (1934).

Notestein thought that the populations of Western and Central Europe would peak in about 1950 and decline thereafter. The corresponding date for Southern Europe was 1970. Like Thompson, Notestein assumed that fertility would fall more steeply than it did in fact. His estimate of the total world population in the year 2000 was 3.3 billion in contrast to today's expected figure of nearly six billion. In his article Notestein elaborated on the reasons for fertility decline. In his own words:

'The new ideal of the small family arose typically in the urban industrial society. It is impossible to be precise about the various causal factors, but apparently many were important. Urban life stripped the family of many functions in production, consumption, recreation, and education.... In factory employment the individual stood on his own accomplishments. The new mobility of young people and the anonymity of city life reduced the pressure toward traditional behaviour exerted by the family and the community. In a period of rapidly developing technology new skills were needed and new opportunities for individual advancement arose. Education and a rational point of view became increasingly important. As a consequence, the cost of child-rearing grew and the possibilities for economic contributions by children declined. Falling death rates at once increased the size of the family to be supported and lowered the inducements to have many births. Women, moreover, found new independence from household obligations and new economic roles less compatible with childbearing'.¹¹

Such quotations have been criticized on the ground that Notestein gave too much attention to socio-economic factors as causes of the decline, and paid insufficient attention to cultural factors. This criticism is perhaps unfair since elsewhere he refers to changes in norms and values associated with the process of modernization. Later authors, such as Coale and Hoover, also gave pre-eminence to socio-economic factors, though they did not entirely ignore cultural aspects.¹² The theory enjoyed a honeymoon which lasted for nearly 20 years, and was widely accepted, at least as a generalization.¹³

THE HISTORICAL RECORD

The first major criticisms of the theory related to the accuracy of its presentation of European demographic history. The original statements were silent, or almost silent, on what may be described as the first (or Malthusian) transition in Western Europe. Malthus advocated postponement of marriage as a means of restraining population growth. This was what actually occurred in Western Europe and was the chief factor in a pre-modern reduction of fertility, though, to be sure, at higher than modern levels.

Large differences in pre-modern fertility were not fully taken into account in the initial formulations of transition theory. Total fertility was as low as 5.0 in early nineteenth-century Sweden, and as high as eight in sub-Saharan Africa today. A major reason for

¹¹ F. W. Notestein, 'Economic problems of population change', *Proceedings of the Eighth International Conference of Agricultural Economists*, (New York, 1953), pp. 13-31.

¹² A. J. Coale and E. M. Hoover, *Population Growth and Economic Development in Low Income Populations*, (Princeton, 1958).

¹³ Transition theory had already been challenged as a *theory* by some mainstream demographers. In a classic book, Hauser and Duncan referred to it as a 'non-theory', because it was a generalization which can only be applied to one historical era, i.e. the modern era. 'Hence there is a big question as to whether it can provide more than vague general suggestions about the factors likely to govern [population] growth in the future'. P. M. Hauser and O. D. Duncan, *The Study of Population. An Inventory and Appraisal*, (Chicago, 1959), p. 14.

these differences was variation in the proportion of women of childbearing age who were married or living in a union.

Differences in pre-modern marital fertility were also substantial, although the causes are not always easy to specify. Differences in breast-feeding practices are likely to have been one factor. There is also evidence that in some societies the upper classes and the bourgeoisie practised birth control, and thus reduced marital fertility.

Another criticism of the initial transition theory was the assertion that mortality decline always preceded fertility decline. Many instances were cited where this did not appear to have been the case, i.e. where fertility and mortality declined simultaneously, or where a fall in fertility actually preceded that in mortality, as is shown in the European Fertility Project discussed below.

Another criticism of early transition theory was that in several European regions actual decline was not tied closely to socio-economic modernization, but rather to diffusion within a specific cultural or linguistic region. In other words, indices such as infant mortality, literacy, or percentage employed in agriculture were less useful in predicting the onset of fertility decline, which occurred more or less simultaneously within the region.

A striking example is the study by Ronald Lesthaeghe of Walloon (French) and Flemish (Dutch) language communities in Belgium.¹⁴ In his study of fertility in different communes he demonstrated many examples of twin communes (one Flemish and one Walloon) with very similar socio-economic characteristics and situated only a few kilometres apart, in which fertility levels differed greatly. The date when fertility began to decline also varied. Combining the data for the two regions into a national figure produces ambiguous results. It should, however, be noted that differences between town and country, as well as in other socio-economic characteristics persisted within linguistic and cultural regions.

As Coale has noted, despite many objections, qualifications, and doubts about the demographic transition the force of the generalization remains.¹⁵ Its greatest strength is the prediction that the transition will occur in every society which is experiencing modernization; its greatest weakness its inability to forecast the precise threshold required for fertility to fall. Efforts to determine this threshold have only been successful in a limited number of cases.¹⁶ As Coale pointed out in his classic statement, the problem in determining a well-defined threshold may be that there is more than one pre-condition for a decline in marital fertility. In abbreviated terms these are:

- (1) Fertility must be within the calculus of conscious choice;
- (2) Reduced fertility must be [perceived] as advantageous;
- (3) Effective techniques of fertility reduction must be available.¹⁷

THE EUROPEAN FERTILITY PROJECT

In 1963 Coale organized a major study of fertility decline in some 600 administrative divisions in Europe. Eleven volumes were published over 20 years with masses of supporting data to cover in detail changes in vital rates that had occurred between 1870

¹⁴ R. Lesthaeghe, *The Decline of Belgian Fertility 1800–1970* (Princeton 1977).

¹⁵ A. J. Coale, 'The demographic transition', *Proceedings of the International Population Conference, Liège*, (Liège 1973), p. 69.

¹⁶ Cf. F. Oechsli and D. Kirk, 'Modernization and the demographic transition in Latin America and the Caribbean', *Economic Development and Cultural Change*, 2 (1975), pp. 391–419, in which the authors correctly predicted the date when Mexico would enter the fertility transition by considering indices for each country derived from a combination of various social and economic measures. However, for countries less developed than Mexico, the anticipated delay did not occur, as the transition swept through the whole cultural area.

¹⁷ Coale, *loc. cit.* in fn. 15, p. 65.

and 1960. The supporting monographs written by distinguished demographers were generally of high quality. This was an enormously ambitious enterprise and was regarded as the definitive study of the subject.

Information on age-specific fertility in nineteenth-century Europe was scarce, so that in most areas it was impossible to determine initial fertility decline directly from available statistical sources, and an indirect method for finding $I(g)$ (total marital fertility) was used as evidence for initial fertility reduction.

Possible weaknesses of this method were noted by Susan Watkins in the chapter entitled 'Conclusions' in the project's summary volume.¹⁸ As is noted below, much more serious doubts about this method have been raised recently.

A serious limitation of this approach is that it disregards the large variations in 'natural' fertility, which is apparently not subject to conscious control. These variations were apparently regarded as unimportant, but observed differences in total fertility which range from five to eight can scarcely be dismissed.

Further, the concept of 'natural fertility' is needed to show that people in pre-transition populations did not know how to regulate marital fertility and did not in fact do so. Though the evidence is mixed, there are persuasive data which show that conscious control of marital fertility was, indeed, practised (e.g. among the upper classes).¹⁹

Some researchers have raised a philosophical concern. The findings of the study clearly point to a cultural, rather than an economic interpretation of fertility decline. But the Princeton project was not designed to measure a cultural hypothesis. It does not explain what it is that determines the timing of fertility decline in a particular cultural or linguistic group. As George Alter has said:

'the data base does not include indicators of culture, and participants in the project have yet to explain what it is about linguistic regions that determines the timing of fertility decline.'²⁰

Did the context of culture perhaps not make much difference? The timing may simply reflect the degree of access to major lines of communication, such as railways, roads, the Danube etc. Nor does it explain the mechanism of the diffusion process which remains postulated but is not demonstrated in the timing.²¹ Is the lack of specificity in this regard as serious as it is in regard to socio-economic variables?

The total effect of these criticisms weakens some of the conclusions of the European Fertility Project. It is interesting that in her concluding comments in the final volume of the study Susan Cotts Watkins states that:

'although the goals of the European Fertility Project were primarily to describe and explain differentials in the fertility transition, a concern for differentials should not obscure the similarities... In the context of a concern for lessons that can be exported from nineteenth-century Europe to contemporary countries elsewhere, it is tempting to emphasize diversity; in the context of the history of fertility in Europe the similarities, in the end, seem most likely to be instructive.'²²

It is these similarities that are picked up by transition theory. They have been so persuasive that the United Nations and the World Bank have based their population forecasts on the assumption of a standard transition.

¹⁸ A. J. Coale and S. Cotts Watkins, *The Decline of Fertility in Europe* (Princeton, 1986), pp. 424-425.

¹⁹ Cf. E. A. Wrigley and R. S. Schofield, *The Population of England: 1541-1871. A Reconstruction*, (London, 1981), and J. Blake, 'The fertility transition: Continuity or discontinuity with the past', *Proceedings of the International Population Conference, Florence, 1985*, Vol. 1, pp. 393-405.

²⁰ In Coleman and Schofield, (eds.) *op. cit.*, in fn. 5. p. 21.

²¹ S. Preston, 'The social sciences and the population problem', in *Sociological Forum*, 2 (1987), p. 667.

²² Coale and Watkins, *op. cit.* in fn. 18, p. 449.

When transition theory is applied to the experience in non-European countries, the regularities are impressive. In every instance mortality has declined first and has been followed by declining fertility, and the result in each case has been a considerable acceleration of population growth. In the initial formulation of the transition, the momentum created (i.e. the percentage natural increase) was greatly underestimated. As was noted above, in 1945 Notestein's projection of the world population for the year 2000 was much lower than the figure expected at present, which is close to six billion.

The transition has become much more rapid than it was in Western Europe. Growth is concentrated in a much shorter period than in Western Europe, with possibly no larger percentage increase. But, of course, the increment for the world as a whole starts from a very much larger base figure, so that actual growth is vastly greater.

Perhaps the European Fertility Project's most important finding is that the transition has occurred under strikingly diverse socio-economic conditions. Whilst a high level of socio-economic development was often accompanied by fertility transition, transition is not a necessary pre-condition for development. As has been demonstrated in less developed countries, the introduction of an effective family planning programme may contribute to fertility decline even at very low levels of modernization. There is an important dimension of innovation/diffusion in the transition that swept over Europe within a relatively short time. This has been a widely accepted modification of transition theory. A good summary of what has been learned from this historical experience is given by Knodel and van de Walle as follows:

- (1) Fertility declines took place under a wide variety of social, economic, and demographic conditions;
- (2) Family limitation was not practised (and was probably unknown) among broad sections of the population before the decline in fertility began, even though a substantial proportion of births may have been unwanted;
- (3) Increases in the practice of family planning and the decline of marital fertility were essentially irreversible processes, once under way;
- (4) Cultural settings influence the onset and spread of fertility decline independently of socio-economic conditions.²³

It has been shown that fertility decline in tropical Latin America, once started, quickly spread to other countries independently of their level of socio-economic development. This has also been noted in countries of Chinese culture, in China itself, and in the 'little dragons' of Hong Kong, South Korea, Singapore, and Taiwan.

THE SEARCH FOR CAUSALITY: MORTALITY

In the demographic literature transition theory has often come to mean the fertility transition alone, rather than joined to the other important transition, that of mortality. The reason is simple. Motives for the reduction of mortality are much easier to explain, and causes are more easily identified.

Three stages of historical mortality decline in the modern world may be distinguished:

- (1) Though some reduction of mortality may well have occurred earlier in Western Europe, it is most clearly identified in the latter part of the eighteenth and the first half of the nineteenth centuries. During the early stages, rising incomes presumably contributed to reductions in mortality (and conversely in mutual interaction). But the

²³ J. Knodel and E. van de Walle, 'Lessons from the past. Policy implications of historical fertility studies'. *Population and Development Review*, 2 (2) (1979), p. 219.

development of the modern state was a decisive influence. In general, the establishment of public order directly reduced deaths from local wars, tribal and clan feuds, and random violence. Probably even more important was the indirect effect of the establishment of an infrastructure in transport and commerce in the modern state that brought about a reduction in famines, and perhaps also in epidemics. Stability probably also contributed to improvements in agriculture.

There has been dispute about the causes of mortality decline during this early period. Some have argued that the early decline was primarily due to improvements in agriculture, reflected in improved nutrition and resistance to infectious diseases independently of medical intervention, improved hygiene etc. This view has been effectively challenged by others who ascribe mortality reductions to improvements in hygiene, as measured by the increasing consumption of soap and of washable cotton clothing.²⁴

(2) During the last third of the nineteenth century up to World War I, there was a revolution in medicine induced by the discoveries of Pasteur, Koch, and others. The resulting reductions in child mortality, and somewhat later in infant mortality, were responsible for much of the decline in mortality, particularly in mortality from diseases such as diarrhoea and tuberculosis.²⁵ During the inter-war period solid gains were achieved in medicine, health education etc., stimulated by progress made during and after World War I.

(3) During World War II and the following period there has been an explosion in the use of antibiotics, initiated by Fleming's discovery of penicillin and its synthesis in 1943.

The cumulative effect of these developments has been a dramatic reduction in epidemic and contagious diseases. Much more difficult to reduce has been mortality from organic diseases, such as diseases of the circulatory system, and cancers, although important gains have been achieved in reducing mortality from circulatory diseases, and particularly in increasing the longevity of older adults. However, the adoption of modern lifestyles has not been responsible for increased mortality from degenerative diseases. They were simply less evident earlier, because of the high incidence of contagious diseases. Current trends in mortality go much further back than is usually supposed.²⁶

A feature of both the mortality and the fertility transitions has been their increasingly faster tempo. A mortality transition that took 75–100 years in Northern Europe to complete was achieved within 20–25 years in Eastern Europe, and within even shorter periods in the less developed countries which came on the scene much later. The existence of an overall income effect on mortality has been demonstrated, especially at lower income levels, but these tend to diminish at higher average levels of income.²⁷

It is perhaps surprising that while mortality decline is usually cited as the *raison d'être* for fertility decline, it is not often accorded a primary place as a *cause* of fertility decline. This is understandable, since efforts to establish a direct close connection have had mixed results.²⁸ Whilst definitive proof of this connection may not be possible, there exist cogent reasons for supposing that it exists. Certainly, reduced mortality and morbidity

²⁴ T. McKeown, R. C. Bower and G. Record, 'An interpretation of the modern rise of population in Europe', *Population Studies*, 26 (3), (1972), pp. 45–82; P. E. Razzell, 'An interpretation of the rise of population in Europe. A critique', *Population Studies*, 28 (1) (1974), pp. 5–17.

²⁵ R. Schofield, D. Reher and A. Bideau (eds.), *The Decline of Mortality in Europe*, (Oxford, 1991).

²⁶ T. B. Gage, 'The decline in mortality in England and Wales, 1861–1964. Decomposition by cause of death and components of mortality', *Population Studies*, 49 (1) (March 1993), pp. 47–66.

²⁷ S. Preston, 'The changing relation between mortality and level of economic development', *Population Studies*, 29 (2) (July 1975), pp. 231–246.

²⁸ S. Preston, *The Effects of Infant and Child Care on Fertility*. (New York, 1978).

and a healthier population are major contributors to a rise in living standards, which are often regarded as a major factor in fertility decline. Perhaps psychological effects are as significant, or even more so. Reductions in mortality and morbidity strengthen the belief that humans can control and modify their environment and destinies. Members of modern societies take a less fatalistic and passive view of life than do members of pre-industrial populations.

Some economists, e.g. Kuznets, see reduced mortality as an absolute prerequisite of modernization.²⁹ It is, of course, difficult to put anything other than a most general value on the contributions of reductions in mortality and morbidity to economic development. But, what would be the position if improved physical health and lower mortality were the primary causes of changing economic attitudes? Views of life have changed and people believe that it is possible to influence one's fate; an attitude that fosters individualism. But it would be fatuous to consider a single cause, and focus on it as the *only* cause. Socio-economic, sociological, cultural, and ideational factors are much too closely intertwined to be isolated.

Nevertheless, mortality reduction should be given greater attention as one cause of fertility decline, notably by promoting economic productivity, especially in a more productive labour force. The major focus of the World Bank's *World Development Report for 1993* is 'Investing in Health', and includes an exhaustive study of the burden of disease. The concept of the 'disability life year' (DALY) has been used as a measure that combines healthy life-years lost because of premature mortality with those lost because of disability. The figures range from 17 per 1,000 population in established market economies to 344 in India, and 574 in sub-Saharan Africa.

Again it is impossible to put a monetary value on these differences, but they must have had a major impact on economic productivity. In other words, reductions in morbidity and related mortality are reflected in improved productivity and economic development. As we stated earlier, the indirect psychological effects of declining mortality are probably even greater than the direct ones.

It is true, however, that mortality reductions in poor countries and the consequent rapid growth of population may impede capital formation and other aspects of development. The results will differ in each individual case, but are at least as likely to be positive as negative. In practice, economic development has usually kept pace with, or exceeded population growth and has reduced fears about the adverse effects of population growth in the modern world.

THE SEARCH FOR CAUSALITY: ECONOMIC THEORY

There has been debate on whether economic, or social and ideational factors are more important in initiating fertility decline. The dominance of economic factors was reflected in the early formulations of transition theory. A pervasive theme in these discussions was that modernization changes the economics of childbearing and makes it seem to be economically disadvantageous. This has led to the formulation of economic theories of fertility decline.

In economic theory, pre-modern high fertility was accepted as rational behaviour, just as the fertility decline is viewed as being based on rational choices. This has replaced the classic theory which contrasts modern rationality with pre-modern irrationality. The first application of micro-economic thinking to transition theory was the 'new home

²⁹ Simon Kuznets 'Population trends and modern economic growth. Notes towards a historical perspective', in *Population Debate, Dimensions and Perspectives*, World Population Conference, Bucharest (1975), vol. i, pp. 425-432.

economics'. The central theme of this 'Chicago School' approach was that reduced demand for children as determined by income, prices, and tastes was the basic driving force in the fertility transition. Prominent exponents of the theory were Gary Becker and T. W. Schultz, each of whom published several books and articles on the subject.³⁰

In the theory's early form, consumer choice was treated as being rather mechanistic, and did not distinguish between acquisition of a baby and purchase of a motor car. This gave rise to Blake's acerbic comment in an article entitled 'Are babies consumer durables?'.³¹

In a highly sophisticated article, Pollak and Watkins³² called attention to the failure of the economist's 'rational actor' to deal with varying preferences and other aspects of culture. 'Culture may define the types of behaviour that are subject to individual choice in a particular society and thus delimit the areas within which the rational actor is appropriate'. Be that as it may, economic and related socio-economic theories have often tended to prevail because they were more successful than cultural-ideational theories in giving conceptual and mathematical precision to their models.

This rather fragmentary exposition does not perhaps do justice to the sophisticated nature of economic theories. Later formulations were more sophisticated, but according to Hirschman 'the approach remains too narrow to be a significant challenge to demographic transition theory'.³³ As Robinson somewhat unkindly put it: 'the proposition [the micro-economic theory of fertility] has not been proven, only asserted often enough to gain a certain credibility and force through repetition'.³⁴

In a landmark article, Cleland and Wilson challenged the economic approach. For them, the evidence suggests that in traditional societies conscious fertility control within marriage was largely absent (i.e. it was not a viable choice). This absence does not necessarily imply a demand for large families. The timing of the transition is strongly influenced by linguistic and cultural boundaries, less strongly by modernization factors, among which indicators of social development, such as women's education and status are more important than economic ones. The link with cultural factors suggests that the transition was more closely connected with the diffusion of new ideas than with changes in micro-economic forces.³⁵

One economist, Richard Easterlin, has made a sophisticated effort to combine economic and sociological theories of fertility decline. He broadens the usually defined factors of demand, supply, and costs of fertility regulation. Under 'demand' he includes the standard socio-economic determinants of the transition used in the modernization hypothesis; 'supply factors' are the cultural elements that constrain natural fertility. 'Costs' are the monetary, time, and psychic constraints in the use of birth control.³⁶ All determinants of fertility operate through one or other of these variables. Demand is measured by stated desired family size, supply by the number of children a couple would have 'naturally' in the absence of conscious fertility control. 'Costs' lump together those

³⁰ Cf. G. S. Becker, *A Treatise on the Family*, (Cambridge, Mass., Harvard University Press, 1981), and T. W. Schultz (ed.), *Economics of the Family: Marriage, Children and Human Capital* (Chicago, Chicago, University Press, 1974).

³¹ Judith Blake, 'Are babies consumer durables?' *Population Studies*, 22 (1) (1968), pp. 5-25.

³² R. A. Pollak and S. Cotts Watkins, 'Culture and economic approaches to fertility. A proper marriage or mésalliance?' *Population and Development Review*, 19 (3) (1993), p. 490.

³³ C. Hirschmann, 'Why fertility changes', *Annual Review of Sociology* (1994), p. 215.

³⁴ W. Robinson, 'Kenya enters the fertility transition', *Population Studies*, 46 (3) (1992), pp. 445-458.

³⁵ J. Cleland and C. Wilson, 'Demand theories of the fertility transition. An iconoclastic view', *Population Studies*, 41 (1) (1987), pp. 5-30.

³⁶ R. A. Easterlin and E. Crimmins, *The Fertility Revolution* (Chicago, 1985). See also R. A. Easterlin, 'The economics and sociology of fertility', in C. Tilly (ed.), *Historical Studies of Changing Fertility* (Princeton, 1978).

incurred in terms of money, time, and inconvenience, with psychic costs, such as dislike for the general notion of family planning or for specific techniques, such as abortion, not to mention religious beliefs.

Easterlin's framework envisages modernization as influencing fertility through intervening variables of supply, demand, and cost of controlling births. Hence, it does not assume either priority or dominance among different economic, socio-economic, and cultural explanations. It is this characteristic that induced the National Research Council's Panel on Fertility Determinants to adopt it as the basic framework for its massive study.³⁷

The transition model has thus received a good deal of attention. But its practical application faces difficulties. The dependent variable is the number of children a woman has borne by the end of her reproductive life, and, therefore, takes a cohort, rather than a period perspective. This is useful for some purposes, but not for the analysis of current events. Furthermore, it assumes a fixed life cycle, (i.e. parents decide at the time of their marriage what number of children they want, and adhere to this decision throughout their fecund years), and it makes no allowance for changes with time and experience. This view certainly conflicts with actual experience.

Like some of his predecessors, Easterlin does not deal adequately with the wide variations in 'natural' fertility in pre-modern societies. He, like the early writers on transition, fails to specify the socio-economic factors that explain demand.³⁸

Though these economic variables are not incompatible with traditional demographic transition theory, they are too narrow for a satisfactory restatement. Their significant contribution is to show how modernization may begin by raising fertility before the fall induced by further modernization, a phenomenon that has been observed in a number of countries. But in contrast to the findings of the European Fertility Project, cultural variables are only given nominal attention.

THE SEARCH FOR CAUSALITY: CALDWELL'S RESTATEMENT

An interesting restatement of transition theory has been offered by Caldwell in an attempt to integrate economic, cultural, and institutional theories of fertility decline.³⁹ In contrast to the original theory he holds that pre-transition fertility behaviour was rational. But he criticizes economic theories of fertility and asserts that fertility behaviour is rational only within the framework established by social ends. All societies are economically rational, but the ends served differ from society to society. His observations are greatly enriched by examples from his own extensive anthropological field research.

Caldwell, unlike earlier transition theorists, makes an important distinction between 'modernization' and 'Westernization'. The first is structural as in economic organization; the second a copying – two very different processes. As he correctly points out there does not appear to be a close relationship between economic modernization and the beginning of fertility decline in the modern world.

The primary force of change appears to be Westernization, which includes ideas of progress, secularization, mass education, and mastery over the environment. This process can precede economic development, as it has increasingly done in less developed areas. Caldwell's argument is supported by the fertility declines which have occurred at

³⁷ R. A. Bulatao and R. D. Lee, *Determinants of Fertility in Developing Countries*. (New York, 1983).

³⁸ Hirschmann, *loc. cit.* in fn. 32, p. 215.

³⁹ See especially J. C. Caldwell 'Towards a restatement of demographic theory', *Population and Development Review*, 2 (1976), pp. 321–366.

very low levels of modernization, as in Bangladesh and – more recently – in southern Africa. In his view an important export of Westernization is the predominance of the nuclear family with its concentration on expenditure for one's children, e.g. on education. This view has been challenged by Cain, who asserts that the nuclear family is no more prone to declining fertility than the extended family, since the latter provides an alternative to children as insurance for security in old age.⁴⁰

Caldwell's name is identified with his wealth flow theory of fertility decline. In this view, the fundamental issue in demographic transition is the direction and magnitude of intergenerational wealth flows. At first, in pre-modern societies, the flow is from children to parents or, more broadly, from the younger to the older generation. Wealth is defined here as including money, goods, and resources.

When there is a transition from the extended to the nuclear family, the pendulum swings and the direction of the flow is now from parents to children. In this situation, being childless is the most rational economic behaviour! But, of course, couples continue to procreate for social and psychological reasons, though they have many fewer children than formerly.

As Caldwell admits, his restatement does not clarify the nature of the specific appeal of Westernized values and family systems. Why does Westernization proceed more rapidly and reach ever lower levels of socio-economic development, as in Bangladesh and sub-Saharan Africa? Whilst Caldwell's theory is very appealing it is, as he himself admits, not readily testable. One serious attempt to test it did not result in confirmation of the theory.⁴¹

THE SEARCH FOR CAUSALITY: CULTURAL AND IDEATIONAL THEORY

A more specifically cultural theory than Caldwell's has been put forward by Lesthaeghe who argues that differences in fertility behaviour are primarily related to cultural differences. This contrasts with the structural influences of socio-economic development which have been described as 'primary' in classical transition theory. Lesthaeghe asserts that differences in fertility levels and their speed of change are related to differences in religious beliefs and practices and in the degree of secularism, materialism, and individuation.

Lesthaeghe's analysis and results are a major modification of classical transition theory. Basing himself on economic theories of economically rational fertility behaviour, limited by its assumptions of exogenous and constant 'tastes', he describes the implication of changing and exogenous tastes. 'In other words, a cost-benefit paradigm is necessary, but not sufficient'. Lesthaeghe adds a theory of 'higher order needs' to classical economic utility theory. Economic prosperity creates a new hierarchy of needs in a tree-like structure: a trunk of basic physiological needs above which grow a diversity of branches or 'higher' needs, including a plethora of luxury goods and, especially, psychological non-material needs.⁴²

Historically in Western Europe this has meant greater freedom of choice and relaxation of religious control, or secularization. Lesthaeghe fully documents the decline in traditional religious beliefs and church attendance and the rising emphasis on

⁴⁰ M. Cain, 'Perspectives on family and fertility in developing countries', *Population Studies*, 36 (2) (1982), pp. 159–175.

⁴¹ T. E. Dow, Jr., L. Archer, S. Khasiani and J. Kekovole, 'Wealth flows and fertility decline in rural Kenya, 1991–92', *Population and Development Review*, 20 (1994), pp. 343–364.

⁴² R. Lesthaeghe, 'A century of demographic and cultural change in Western Europe. An exploration of underlying dimensions', *Population and Development Review*, 9 (3) (1983), p. 411.

individual discretion and 'higher' needs, such as individual wants: in contrast to community wants; in other words, changes directed towards individualism and concepts of self-fulfilment. How does this relate to fertility decline?

'A fertility decline is in essence part of a broader emancipation process. More specifically, the demographic regulatory mechanisms, upheld by the accompanying communal or family authority and exchange patterns give way to the principle of individual freedom of choice, thereby allowing an extension of the domain of economic rationality to the phenomenon of reproduction.⁴³

'The underlying dimension of this shift is the increasing importance of the central position given to the attainment of individual goals. As a result, the extent to which a trend in this direction of greater individual orientation and personal discretion is curbed or permitted seems to be of paramount significance for the pattern of change with respect to all aspects of family life and procreation'.⁴⁴

While eminently logical, the application of these ideas to fertility decline is somewhat tenuous, because the precise link is not always clearly defined. It is true that fertility transition during the late nineteenth and early twentieth centuries proceeded in parallel with cultural-ideational changes in the direction of individualism and self-fulfilment, and according to Lesthaeghe, in the quality of conjugal relationships and of children within the nuclear family. This appears to be a weak link in the chain of reasoning and empirical demonstration.

It is, of course, true that recent changes in the direction of ever greater preoccupation with the welfare and self fulfilment of individuals have been accompanied by increases in pre-marital sexuality and cohabitation, more children born out of wedlock, more divorce etc., as well as by further declines in fertility. Thus, as a sociological generalization it is very attractive and could be applied to family structure and fertility decline, at least in theory.

Lesthaeghe is a leading representative of the European emphasis on cultural values, as opposed to emphasis on material aspects which is favoured by American authors. However, as noted below, the two are not as opposed as they may seem.

THE SEARCH FOR CAUSALITY: HISTORIANS' VIEWS

'Demography is too important to be left to demographers'. Economists reached this conclusion many years ago and have taken an active interest in this field. Now, some historians have reached the same conclusion.

Of course, historians have not been entirely absent among early writers on the transition. Especially noteworthy are the contributions by E. A. Wrigley and his colleagues.⁴⁵ Actually, demographers have dealt exhaustively with historical topics, but as 'historical demographers' rather than demographic historians. The latter have been rather sparse.

A reflection of historical interests is provided in a notable book, edited by Charles Tilly,⁴⁶ who is himself an historian, and which includes contributions from five historians and three demographers. As Tilly points out, the question is how and why basically agrarian populations (and more especially peasants) turned first into an urban industrial proletariat, and later into a bourgeois society. The first change leads to continued high, if not rising, fertility; the second to fertility decline.

⁴³ *Ibid.* p. 411.

⁴⁴ *Ibid.*, pp. 429, 432.

⁴⁵ Cf. his books entitled *Industrial Growth and Population Change* (1961); *Population and History* (1969), and, as editor, *Introduction to English Historical Demography* (1966).

⁴⁶ C. Tilly (ed.), *Historical Studies of Changing Fertility* (Princeton, 1978).

In a more recent book, edited by Gillis and others, there is a strong plea for the inclusion of historical cultural features in studies of the fertility transition. The massive Princeton project, did not include historians among its contributors. In an appraisal of the study, Alter says:

'The importance of linguistic regions clearly points to acultural interpretation of fertility decline in contrast to the economic factors emphasized by the theory of the demographic transition. Unfortunately, the European Fertility Project was not designed well enough to examine a cultural hypothesis. The data base does not include indicators of culture, and participants in the project have yet to explain what it is about linguistic regions that determines the timing of fertility declines.'⁴⁷

Thus far no attempt has been made to characterize the cultural differences between linguistic regions. In Alter's view, Lesthaeghe comes closest to this in his measure of secularization, such as his analysis of the relation between voting for socialist candidates in elections and fertility change. He regards Caldwell's restatement as fundamentally a cultural rather than an economic model.⁴⁸ Historians are critical of the standard focus on economic and social structure, and of an economic determinism which holds that the broad broom of industrialization sweeps away high fertility rates.

Several contributors to the book focus on the culture of reproduction as a factor in the fertility decline or lack of it. According to Seccombe:

'Great advances have been made in the study of gender relations in the 1970s and 1980s, but very few of them are reflected in demographic theories of fertility decline.... Sexual desire and conjugal power are absent from the mainstream paradigms of fertility regulation.'⁴⁹

'To engender family limitation [through contraception] both spouses must have a strong desire to cease childbearing and the capacity to take effective action toward that end. The dilemma for a great many working-class families in the early twentieth century was that the two necessary conditions were disjointed. The women were strongly motivated but lacked the power to avoid coitus and the means to avert conception, while men had it in their power to abstain, withdraw, or use condoms, but were not sufficiently motivated to restrain their sexuality with consistency.... If married women were already keen to shorten their childbearing careers, what brought husbands round to their way of thinking?... the major impetus, in my view was the underlying shift in the family economy, moving men's reproductive interest increasingly in line with those of their spouses.'⁵⁰

This shift was related to the removal of children's role as economic contributors, and to the increasing cost of children, which were the consequence of three processes:

- (1) state intervention in fixing a minimum legal age at marriage, compulsory schooling, a minimum legal working age, and social policies aimed at redistributive justice;
- (2) transformations in the labour market, as in the increase in the number of service posts suitable for women (e.g. in the civil service);
- (3) a cultural redefinition of family responsibilities towards children which resulted in a flow of responsibility first from children to parents, and later from parents to children. There was a redefinition of motherhood from childbearing to child rearing.⁵¹

⁴⁷ G. Alter, 'Theories of fertility decline: A non-specialist's guide to the current debate', in J. R. Gillis, L. A. Tilly and D. Levine (eds.), *The European Experience of Declining Fertility 1850-1970. The Quiet Revolution*, (Oxford, 1992) p. 21.

⁴⁸ *Ibid.* pp. 24, 39.

⁴⁹ E. Seccombe, 'Men's 'marital rights' and women's 'wifely duties: Changing conjugal relations in the fertility decline', in Gillis *et al.*, *op. cit.* in fn. 46, p. 66.

⁵⁰ *Ibid.* p. 77.

⁵¹ C. Saraceno, 'Constructing families. Shaping women's lives', in Gillis *et al.*, *op. cit.* in fn. 46, pp. 251-252.

The change in parents' attitudes towards their children was not motivated only by the family's economic situation, but also by changes in values which emphasized the quality of children, rather than their quantity.⁵²

A feature of the culture of reproduction was the obstructions by members of the medical profession who initially opposed birth control, sometimes for bizarre reasons. Leaders of the British Medical Association condemned contraception as unnatural, and warned that all sorts of maladies would befall their users. Semen was envisaged by some as an elixir for women's health when absorbed through the vaginal wall!⁵³ Professional advocates of birth control were, of course, opposed to abortion, and sometimes to the use of condoms, because of their association with premarital intercourse.

Other contributions include a discussion of the historical effects of war on women's roles; a subject not covered in conventional transition theory. In its initial stages, war greatly expands women's roles because of the mobilization of men. Post-war demobilization brings them back to family responsibilities. According to Winter, this resulted in the post-war baby-boom.⁵⁴ However, the war opened women's eyes to different choices and different roles for themselves. In the longer run, fertility continued to decline in accordance with pre-war trends.

Haines reviewed the effects of social class in promoting or retarding the transition.⁵⁵ Lees showed how the welfare state first encourages fertility reduction, but later attempts to prevent it.⁵⁶ In sum, historians have contributed to transition theory, in some cases by using different emphases, and in others by new insights in the culture surrounding reproduction.

THE SEARCH FOR CAUSALITY: THE ROLE OF GOVERNMENT

The role played by government is manifestly of great importance in the decline of both mortality and fertility. With increasingly active governments and the rise of the nation state came public services that reduced mortality – the provision of pure water, vaccination, control of epidemics and famines, as well as other public health measures. Expansion of the peace area in the modern state reduced deaths from tribal and internecine warfare; through policing it also reduced violence and increased public safety.

Governmental influence on fertility decline is, of course, equally apparent. Compulsory schooling increased the cost of children, as did measures to outlaw child labour and child exploitation. The changing structure of the economy created jobs suitable for women, not least in government itself.

The most conspicuous aspect of intervention, however, is the attitude taken by government and political leaders on population policy. Perhaps most striking is the experience of China, where the government launched a comprehensive and rigidly enforced family planning policy during the late 1960s which brought about an

⁵² Saraceno, *ibid.* p. 252. See also J. Schneider and P. Schneider, 'Going forward in reverse gear: Culture, economy, and political economy in the demographic trends in a rural Sicilian town', in Gillis *et al.*, *op. cit.* in fn. 46, pp. 146–178. 'Reverse gear' refers to *coitus interruptus* compatible with non-Western ideas which actually promoted the transition in the lower classes when used, rather than the unliked modern contraceptive (p. 225).

⁵³ Seccombe, in Gillis *et al.*, *op. cit.* in fn. 46, p. 71.

⁵⁴ J. M. Winter, 'War, family, and fertility in twentieth-century Europe', in Gillis *et al.*, *op. cit.* in fn. 46, pp. 291–309. I suspect, however, that a major cause was the making-up of some of the deficit in births caused by the war.

⁵⁵ M. Haines, 'Occupation and social class during the fertility decline. Historical perspectives' in Gillis, *et al.*, *op. cit.* in fn. 46, pp. 193–226.

⁵⁶ L. H. Lees, 'Safety in numbers. Social welfare legislation and fertility decline in Western Europe', Gillis, *et al.*, *op. cit.* in fn. 46, pp. 310–325.

unprecedented drop in fertility in the 1970s, when the policies were relaxed and fertility reached a plateau. This was followed more recently by a return to the old policy and a new decline of fertility which brought it down to replacement level, with a TF of 2.0 to 2.1.

A comparison of the experience of two Latin American countries illustrates government influence in that region. In Colombia during the mid-1960s a group of progressive medical practitioners organized a family-planning association called Profamilia, which initiated a community-based programme to provide family-planning services. The government at first adopted a stance of benign neutrality, but later began itself to provide a national programme of family planning. TF in Colombia was close to 7 during the early 1960s, but fell rapidly to its present value of 2.7.

In Mexico, the government was firmly opposed to family planning until 1972, when the policy was reversed and a national family-planning programme launched rather rapidly. The birth rate which had remained at pre-transition levels until the early 1970s, fell precipitously and its course paralleled the decline in Colombia and continued to do so until the present, though at 3.2, TF in 1992 was still higher in Mexico than in Colombia, in spite of the fact that indices of socio-economic status were higher in Mexico.

The experience in Pakistan and Bangladesh illustrates the limitations of government intervention, when conditions are not ripe for it. During the 1960s, President Ayub Khan introduced a crash programme for Pakistan. It was a complete failure and fertility in Pakistan has only begun to fall very recently.

In Bangladesh, the government initiated a cautious family-planning programme which was progressively strengthened. By 1992, TF had fallen from 7.0 which applied before the programme started to 3.4. The difference, with Pakistan, is that by the later date, Bangladesh had been affected by Westernization, and extreme poverty had spurred on public and governmental support.

The importance of political orientation is illustrated by the comparative experiences of South and North Korea. In the Republic of Korea TF is 1.8, in the Democratic Republic of Korea 2.5. In South Korea there was an active programme designed to provide knowledge of and access to family planning. There was no such programme in communist North Korea.

Overall, there is as expected a clear correlation between the strength of the programme effort and rates of fertility decline.⁵⁷ Also, the degree of success is correlated with readiness to adopt contraception, as measured by level of socio-economic development, desired family size etc.

While direct implementation of family planning programmes is undertaken by nation states, international guidelines and targets have had some influence, as, for instance, the World Plan of Action adopted at the Population Conference in Bucharest in 1984. The World Population Conference held in Cairo in September 1994 established a more comprehensive plan. The Cairo conference (formally the International Conference on Population and Development) produced a 'programme of action', a 20-year blueprint for stabilizing world population and fostering economic and social development. This programme called on governments to provide 'universal access to a full range of safe and reliable family planning methods and to related reproductive health services by the year 2015'. In a dramatic departure from previous manifestos, it states that raising the status of women is a prerequisite for further reductions in birth rates. Such international

⁵⁷ W. P. Mauldin and J. Ross, 'Prospects and programs for fertility reduction 1990-2015', *Studies in Family Planning*, 25 (1994), pp. 77-95. See also the same authors' 'Family planning programs. Efforts and results', *Studies in Family Planning*, 22 (1991), pp. 350-367.

agreements are bound to have an effect on the adoption of national family-planning programmes.

Even with the spread of family planning programmes and the consequent increased use of contraception, estimates of future population growth in the less developed countries caused by unwanted fertility unchecked by effective contraception are staggering. Desired family size remains high in many countries, and population momentum resulting from the large percentage of females of reproductive age is another reason. Even if the first two factors were to be eliminated early, (which seems unlikely) population momentum alone will carry the population of the less developed world to much higher numbers in the twenty-first century, so that family planning programmes, no matter how successful, will not be sufficient to stem high population growth.

An additional strategy is needed to reduce population growth, which would emphasize 'human development', particularly education, raising women's status, and improving child health. Of course, such policies course are valued in their own right, but education, particularly of girls, has been shown to be the factor most closely related to fertility decline, by delaying marriage and first births. Increasing equality between the sexes in legal, economic, and social affairs raises the cost of children by making roles other than childbearing more feasible and attractive to women. Reducing child mortality and measures to improve child welfare have everywhere been associated with fertility reduction.

It is possible that the European and Japanese experience will be repeated in some countries in the contemporary underdeveloped areas of the world which are more developed. Fertility has already fallen below replacement level in Hong Kong, Singapore, South Korea, and Taiwan. In China, TF at 2.0 is at replacement level. In some European countries reductions in fertility have already resulted in zero natural increase, or even the beginning of population decline, though in some cases the effects have been weakened by immigration.

Van de Kaa and others regard a future decline of population in Europe as inevitable.

'When all is said and done, the only reasonable expectation is that Europe, at least most of it, will inevitably see birth and death rates converge at low levels, followed by population decline'.⁵⁸

Not unnaturally, there is growing interest in efforts to raise fertility, rather than reduce it. In France, of course, there is a long history of family allowances designed for this purpose. But, except in special circumstances such programmes have not been conspicuously successful.

THE SEARCH FOR CAUSALITY: THE ROLE OF DIFFUSION

Diffusionist ideas are common in the demographic literature and can be found in the earliest expositions of transition theory. But even today discussion of diffusion dynamics in the fertility transition is lacking in conceptual clarity, and little attention is given to general diffusion theory, as presented by Everett Rogers and others.⁵⁹ Yet without the assumption of diffusion it would be difficult – if not impossible – to explain the rapidity and pervasiveness of fertility declines. With reason, some authors have depicted diffusion as a third type of causal agent, in addition to supply and demand.⁶⁰

⁵⁸ D. van de Kaa, 'Europe's second demographic transition', *Population Bulletin*, 42 (1987), Washington D.C. p. 46.

⁵⁹ E. M. Rogers, *Communication Strategy for Family Planning*, (New York, 1973).

⁶⁰ C. L. Rosero-Bixby and J. Casterline, 'Modelling diffusion effects in fertility transition', *Population Studies*, 42 (1993), pp. 147–167.

The case for diffusion is strengthened because changes in reproductive behaviour have proceeded much faster than economic changes which have commonly been given priority. More broadly, the widespread adoption of family planning cannot be explained without assuming a major diffusion of new ideas and techniques, notably in its rapid adoption within linguistic and cultural areas in which levels of modernization differ widely. Diffusion is likely to follow established lines of communication between friends, neighbours, relatives, and the local community and in the larger arena of common language and culture and established lines of communication.

Diffusion is not merely a residual, but an active agent in promoting or retarding the practice of fertility control. Historically, fertility reduction is an innovation followed by diffusion, not merely an adjustment to new socio-economic conditions. An individual's or couple's acceptance or rejection of family planning is explained by the adoption potential of an innovation rather than by socio-economic conditions. According to Carlson:

Birth control behaviour is contagious and the fertility behaviour of a population is not the simple aggregate of isolated individual decisions, but the end product of complex social interactions.⁶¹

In other words, control of fertility is as much a group decision as a decision of an individual or couple. In the modern world fertility declines are more closely associated with the diffusion of an idea than with micro-economic forces.⁶²

There is a shortage of studies on the role played by diffusion, except with reference to government-organized birth control programmes, where it has been the subject of a special study. Freedman has emphasized its importance. 'Family programs are unlikely to succeed unless they reach the mass of the rural population through the small primary groups that define the social world of village residents.'⁶³

It is no coincidence that the new fertility transition in less developed areas was accompanied (and possibly preceded) by the transmission of ideas through advances in the media, notably radio and especially television. These can readily cross international boundaries even (perhaps particularly) when their purpose is to amuse rather than to instruct. But their legitimization requires that they be confirmed in informal day-to-day communications with significant others, such as relatives, friends, and leaders in the local community. As Watkins has said: 'even when the couple is literally alone in the bedroom, the echoes of conversation with kin and neighbours influence their action.'⁶⁴

A potentially fruitful line of inquiry, especially in countries that are just entering the fertility transition is the networking that initiates or legitimizes birth control. This is especially true of rural populations in which social control acts through gossip and informal conversations that define the social world of residents. However, as McNichol has put it, the role of diffusion 'is still description in search of a theory'.⁶⁵

⁶¹ G. Carlson, 'The decline of fertility. Innovation or adjustment process?', *Population Studies*, 20 (1966), p. 165.

⁶² Cleland and Wilson, *loc. cit.* in fn. 34.

⁶³ R. Freedman, 'The contributions of social science research to population policy and family program effectiveness' *Studies in Family Planning*, 18 (1987), pp. 57-82.

⁶⁴ S. Cotts Watkins, 'From local to national communities. The transformation of demographic regions in Western Europe, 1870-1960, *Population and Development Review*, 16 (1990), p. 242. Watkins has repeatedly emphasized the role of diffusion and the importance of studies of how gossip and conversations with kin, friends, and community leaders affect the acceptance or rejection of birth control.

⁶⁵ G. McNichol, 'The agenda of population studies. A commentary and a complaint'. *Population and Development Review*, 18 (1992), p. 406.

This review has indicated that almost any change in the direction of modernization may be listed as a 'cause' of the transition, and rightly so, since the demographic transition is itself an integral part of the process and hence interrelated with other aspects.

All the aspects of causality mentioned above operate through proximate variables, such as age at marriage, age at first exposure to the risk of pregnancy, breastfeeding, coital frequency (including absence of spouse, or return of women to their natal family to give birth and live with them post partum), infertility as well as contraception and abortion. That is why the culture of reproduction is so important.

Another aspect of causation is the role played by contraceptive technology which, in some cases, is the most obvious cause of demographic change. Murphy has shown that fertility change in Britain during the 1960s and 1970s was dominated by the spread of the contraceptive pill, rather than by remote economic factors,⁶⁶ the importance of which he suggests have been overemphasized.

This review may leave an impression of chaos. An admirable effort to provide system and order is the two-volume work on *Determinants of Fertility in Developing Countries*.⁶⁷ These volumes contain some 38 contributions, including many by leading demographers none of whom contributed to the Princeton European Fertility Study, and conversely. Part of the reason for this mutual separation is due to the fact that one work deals with European demographic history, the other with the situation in contemporary less developed countries. Nevertheless, there is a notable difference in points of view, one work is concentrated on cultural and ethnic differences, the other uses a basic framework derived from economic theory.

If there is a single or principal cause of fertility decline, it is reasonable to ascribe it to falls in mortality, which was the major cause of destabilization. It was a vital factor in reducing this passive fatalism characteristic of most of human history.

These and other contributions have given a deeper meaning to transition theory. But several other points are relevant.

(1) All the suggested causes of the transition are, in fact, closely linked, and like the demographic transition itself are an essential part of the process of modernization. No country has been modernized without going through the demographic transition, and this is likely to be the case in the future as well;

(2) Because economic and socio-economic features are more easily measured and hence regarded as being 'more scientific', they have been accorded a perhaps undeserved dominance in explanatory theories. This is more evident in American than in European writings on the subject;

(3) The original theory with which most theories of causation are mutually compatible was very broad, but emphasized different elements;

(4) The proposed revisions are no more able to predict the initiation and cause of the transition than the original theorists.

The European Fertility Project did demonstrate that once the fertility transition had been established in a linguistic or cultural area in Europe it spread rapidly and independently of socio-economic level achieved. Though this had not been generally forecast, it did, in fact, so spread in Latin America, and in areas of Chinese culture in East Asia. Again, the latter development was not forecast, but only observed after the event. It remains to be seen whether the same process will apply in the Arab or Moslem Middle East, and in sub-Saharan Africa.

⁶⁶ M. Murphy, 'The contraceptive pill and female employment as factors in fertility change in Britain 1963-80. A challenge to the conventional view', *Population Studies*, 42 (1993), pp. 221-243.

⁶⁷ See fn. 37.

The diversity of cultures, socio-economic levels, and demographic factors, such as age at marriage, preclude precise prediction. This failure is neither unique nor is it limited to demographic theories; it is characteristic of all theories in the social sciences.

But I return to an earlier theme. No unique cause exists. Perhaps all aspects of modernization may be described as related to the demographic transition which in itself is an essential part of modernization. In a perceptive article, Karen Oppenheim Mason wrote:

‘It is time to stop fighting about an either/or scenario and to recognize that there is likely to be a complex interplay among several factors involved in any fertility decline – with a different mix involved in each decline.’⁶⁸

Most of the present paper has been devoted to the determinants of fertility and mortality, rather than to the transition as a determinant of socio-economic levels and trends. Demographic change was perceived as being determined by socio-economic causes, rather than as an interaction between them.

The economic implications of the demographic transition are many, but are too complex to be fully discussed here. They have been organized and fully discussed by Chesnais in his impressive book on the demographic transition.⁶⁹

Broadly, there are two opposing theoretical perspectives in which the nature of the demographic transition can be discussed. The first sees population growth, and especially rapid population growth, as a major brake on economic development. The second views it as a stimulant to economic growth. The first is characteristically used when referring to the less developed world, the second for industrial economies with low fertility.

A very serious and important criticism of the implications of the fertility transition for public policies has been put forward during the recent past. This is the finding that rapid population growth is not necessarily, nor even usually, a crucial impediment to economic development and rising incomes.⁷⁰

Dramatically different results can be obtained by slight changes in the initial assumptions.⁷¹ Evidence of the changing view is the National Research Council’s report on *Population Growth and Economic Growth*, where it is stated:

‘But it is clear despite rapid population growth developing countries have achieved unprecedented [gains in] levels of income per capita, literacy, and life expectancy over the past 25 years.’⁷²

In earlier studies it has been asserted that high dependency ratios caused by the large number of children in countries in which fertility was high would require increased expenditure on education, and thus reduce the savings needed to achieve economic growth. In more recent studies no clear relation has been established between investment in education and other social measures on one hand, and age structure and rates of population growth on the other.⁷³

⁶⁸ K. Oppenheim Mason, ‘Culture and fertility transition. Thoughts on theories of fertility decline’. *Genus*, 40 (1992), pp. 1–14.

⁶⁹ J. C. Chesnais, *The Demographic Transition. Stages, Patterns and Economic Implications*. Translated from the French. (Oxford, Clarendon Press, 1992).

⁷⁰ Cf. S. Enke, *Economics for Development* (Prentice Hall, 1963), and Coale and Hoover, *op. cit.* in fn. 12.

⁷¹ H. Leibenstein, *A Theory of Economic-Demographic Development* (Princeton, Princeton University Press, 1954); D. Ahlberg, ‘The impact of population growth on economic growth in developing nations. The evidence from macro-economic demography’ in D. G. Johnson and R. Lee (eds.), *Population Growth and Economic Development: Issues and Evidence* (Madison, Wisconsin, 1987).

⁷² National Research Council, *Population Growth and Economic Growth*, (Washington, D.C. 1986).

⁷³ Cf. T. P. Schultz, ‘School expenditures and enrolments, 1960–80’, in Johnson and Lee, *op. cit.* in fn.

These findings have resulted in increasingly strained relations between the scientific world and policy-oriented authors. The former have been blamed for undermining a major rationale for birth control programmes to reduce fertility.

THE CURRENT STATE OF THE TRANSITION

With 50 years of hindsight, where does the demographic transition stand today?

First, given a modicum of domestic and international peace, mortality has fallen in every country and has been a part of socio-economic progress. The mortality transition has spread through most of the world. Life expectancy in industrial high-income countries is now between 75 and 80 years and may be approaching a ceiling, but, at best any further increases will be slow. Infant mortality in these countries is less than 10 per 1,000 births, and further progress can only be slow and its impact minimal. The lowest infant mortality has been reached in Japan with a rate of five per 1,000, which must be close to the biological minimum.

These countries have presumably reached the end of the mortality transition. The rest of the world is on a moving escalator of declining mortality. Only in sub-Saharan Africa do pre-modern levels of mortality persist, but even in that region, there is progress. Among countries with more than one million inhabitants life expectancy at birth is less than 50 years in 18, all in sub-Saharan Africa. But as recently as 1975 there were 43 such countries, and in 1960 the number was about 70. Apart from wars, internal violence, and natural catastrophes death rates are falling everywhere.

Secondly, the fertility transition has reached every major region. It has affected every country in Latin America and the Caribbean, with the possible exception of Haiti. In Asia, the transition has begun in all major countries, most strikingly in China, where fertility has now been low for more than a decade (at a level of 2.1–2.5, and now at 2.0 slightly below replacement level). Apparent exceptions are marginal: Afghanistan, Bhutan, most of the Arab Muslim countries in Asia Minor, and war-torn Cambodia and Laos. Vietnam has clearly entered the transition.

Countries with Moslem traditions have been slower to enter the transition than others. But in the largest Moslem country, Indonesia, TF was 3.0 in 1991 well on the way to replacement level. The Arab North African countries are well advanced in the transition. In Pakistan, and more remarkably in Bangladesh, there is movement. In the latter very poor country, fertility decline has been astonishing. Not many years ago, TF was between six and seven children per woman. By 1990–91 the figure was 4.3, and only three years later it was 3.4.

Results from the 1992–93 National Health Survey in India, based on some 90,000 respondents showed national TF to be 3.39, with one state – Kerala – below replacement level with a figure of 1.8.

The fertility transition has even reached parts of Moslem Asia Minor. Fertility has clearly fallen in Bahrain and Qatar (TF 4.2 and 4.5 respectively), and to some extent in Kuwait and the Arab Emirates. In Saudi Arabia, and especially in Oman, TF remains high at 6.5 and 7.8 respectively.⁷⁴

Most resistant to change has been sub-Saharan Africa. However, some fertility decline has been reported recently in all the 20 countries of the region covered by the Demographic and Health Survey, with the exception of Uganda. Methodological problems raise doubts about the reality of these declines in a number of countries, but there is clear evidence of a fall in fertility in contiguous countries of southern Africa,

⁷⁴ 'Six Arab nations show considerable variation in current fertility levels and infant mortality rates', *International Family Planning Perspectives*, 20 (1994), pp. 79–81.

including Botswana, Zimbabwe, Lesotho, Swaziland, Namibia, and especially the black population of South Africa. What is perhaps most striking is that the TF for the black population of the chief cities is now 2.6, a figure which, given the high level of mortality in these countries is near the replacement level of 2.1 to 2.2.

In other parts of the region, the most dramatic evidence for fertility decline comes from Kenya. From a situation where the TF exceeded eight, (the highest recorded fertility in the world), fertility has apparently fallen precipitously. In general, progress has been greatest in the former British colonies, the former Portuguese and Italian colonies have lagged behind; the highest levels currently reported are found in the former French Sahel, except Senegal. It is probable that surveys taken during the 1990s will add several, perhaps many, countries to the list of those which are clearly experiencing fertility decline.

In short, the fertility transition is becoming universal and every country can be placed on a continuum of progress in the transition, as was predicted some 50 years ago.⁷⁵

Thirdly, once the fertility transition has begun (e.g. by a ten per cent reduction) it is inescapable. In every country in the world, given a modicum of peace and prosperity, mortality continues to decline. Once a country has started firmly on the path of fertility decline, it has been successful in reducing it to low levels. Some authors have asserted that the baby boom in the United States and some other countries provided evidence for the contrary view. But in general these phenomena have proven to be temporary blips in a continuing process of change. An interesting case is Nazi Germany, where there was a substantial rebound in fertility allegedly caused by government policy and propaganda. However, it has been shown that the main cause of this increase was a reduction in unemployment and that it did not continue after the war.

A number of papers have been published which suggest that in some countries including Costa Rica, Trinidad and Tobago, and Malaysia the decline stalled at a level well above replacement. It remains to be seen whether more recent new information will confirm this. Most convincing is the case of Argentina, which is not often mentioned in this context. In this country with a population largely of European origin, fertility had fallen earlier, but the decline stalled when TF was about 3.0, and the present level is reported as about 2.6. Quite significant also is the situation in Iran, where the birth rate increased following the conservative Muslim revolution, but more recently fertility decline has been resumed. It is, of course, always possible that strong pro-natalist action on the part of government in a country may bring about a strong and permanent reversal of the trend, but this has not yet been reported as having occurred anywhere, and seems unlikely to do so in the future.

Fourthly, contrary to the views of a number of prestigious observers, fertility decline in the less developed countries (excluding China) did not really slow up during the 1980s. It did slow in absolute terms, but not in terms of the percentage declines required to reach replacement (TF = 2.1). The less developed countries appear to have experienced as great a reduction in fertility during the 1980s as they did earlier. This anomaly is due to the fact that the less developed countries as a whole were further along the path of transition in the 1980s, so that while quantitative declines were smaller, the percentage declines were equivalent.⁷⁶

In China there was, indeed, a temporary stall. After a very precipitous decline associated with strong government backing for birth control policies during the 1970s

⁷⁵ D. Kirk, 'Population change and the postwar world', *American Sociological Review*, 91 (1944), pp. 28-35.

⁷⁶ R. Freedman and A. K. Blanc, 'Fertility transition. An update', *International Family Planning Perspectives*, 18 (1992), pp. 44-50.

which lowered the TF to 2.3 in 1980, fertility fluctuated around this figure during the following decade, as the rigid anti-natal policies of the period were relaxed. However, Chinese fertility has fallen again during the last few years. TF has fallen by almost one-quarter between 1987 and 1992, from 2.46 to 1.9.

Fifthly, the timing of decline in countries with non-European traditions conformed to the forecasts by the original authors of transition theory. Without exception, falls in mortality preceded declines in fertility. Whilst the originators of transition theory greatly underestimated the rate of increase that would emerge, in general the period of the transition in non-European countries was shorter than in countries inhabited by Europeans.

Sixthly, in Europe fertility has declined to well below replacement level, and in a few areas population actually declined, though the effect has been tempered by immigration in some cases.

Seventhly, the new balance of births and deaths forecast by the early proponents of transition theory has not materialized. Except for a few outliers, like Iceland, Ireland, and Albania, fertility has been below replacement in *all* European countries. Most striking is the situation in Southern Europe (Italy, Spain, Portugal, and Greece) where TF at present is between 1.3 and 1.4, two-thirds of replacement level.

Very low values of TF have also been found in some non-European countries, such as Japan, Hong Kong, Singapore, South Korea, and Taiwan, but in none has there been a rebound, except for a levelling off at 1.8 in Singapore, where the government has adopted a pronatalist policy.

Eighthly, the transition is now beginning at increasingly lower levels of socio-economic development. This is most striking in Bangladesh, one of the poorest nations in the world.

The survival of transition theory is enhanced by the fact that there is no theory of equal value which could be used to forecast future population trends, or act as a guide to empirical research. As Chesnais has stated 'it is the only interpretative scheme which reflects a synthetic and coherent view of contemporary demographic changes'.⁷⁷

Chesnais's book is the most thorough review of the theory published during the last decade and merits special attention. He states that while the above is the theory's greatest strength, its alleged greatest weakness is its inability to predict the timing of specific patterns of future development in particular countries. However, this weakness is common in all the social sciences. Like many others, Chesnais deplors the fact that the original theory had little to say about the part played by nuptiality and other cultural aspects in creating widely divergent fertility levels in pre-modern or traditional societies. He also criticizes the earliest proponents of the theory for ignoring, as did many subsequent commentators, the parts played by international migration and the development of transport and communications in modern times.

Thus, some authors regarded the early transition which occurred in Bulgaria, in spite of its low level of development, as an exception to the theory. However, the explanation here is the Danube which has for a long time served as an avenue of trade and communication. As the present writer has noted earlier, fertility during the inter-war period and in the mid-stream of transition, had generally been lowest in areas adjoining the Danube in Austria, Hungary, Yugoslavia, Romania, and Bulgaria than in other regions of these countries which were more remote from this important artery of commerce and communication.⁷⁸

⁷⁷ Chesnais, *op. cit.* in fn. 68.

⁷⁸ D. Kirk, *Europe's Population in the Inter-war Years* (League of Nations, 1946), Fig. 17 and Chapters 5 and 12.

In his book Chesnais identifies and tests three central propositions of transition theory:

(1) The chronological sequence of mortality declining first, followed by declining fertility. He shows that most of the exceptions cited are not real exceptions at all.⁷⁹ This is made more plausible by the charge that the evidence commonly presented (e.g. the European Fertility Project) is methodologically flawed;

(2) He provides a model of the reproductive transition in two phases: restriction of marriage followed by limitation of births. This was not included in earlier versions of the theory, and is a suitable modification of transition in Europe.

(3) The influence of modernization on the onset of fertility decline. Earlier versions of the theory regarded socio-economic development as an essential ingredient but failed to predict the diversity of demographic and socio-economic conditions during the transition. But despite the multiplicity of historical, geographical, and institutional contexts, it remains true that the transition was promoted by similar mechanisms.

Another aspect is that early and (many later) versions of the theory failed to note the importance of increased international movements (migration, trade, communications, and transport), and that the founders of the theory underestimated the importance of innovation and diffusion. The rapid spread of family planning in a specific cultural or linguistic area was not foreseen, but has become a very useful modification of early transition theory. As noted above, even proponents of diffusion theory have not always fully recognized the importance of communications and trade.

THE INSTITUTIONAL BACKGROUND OF TRANSITION THEORY

Even with the hindsight of 50 years it has not been resolved whether the demographic transition is a theory, a generalization, a framework for analysis, or merely an 'idea'. Or is it an 'historical model, predictive model, or a mere descriptive term'? The debate about the status of transition theory continues to occupy a central place in demography.

Recent demographic literature has to some extent turned from the discussion of substantive issues to explanations of the theory's survival, its institutional contexts, and its philosophical foundations. In simplest terms, the theory has survived because no better theory has emerged to explain demographic behaviour in the modern world.

For some historians, transition theory was 'dramatically shattered' by the work of historical demographers, particularly the European Fertility Project. But as has been pointed out above, some of the apparently damaging conclusions of this study can be challenged on methodological grounds.

The institutional context has been explored amongst others by Dennis Hodgson and Simon Szreter.⁸⁰ In his scholarly paper Szreter contrasts the reception of Thompson's article in 1929 with that of Notestein's in 1945. He attributes this change to three factors:

(1) A changed institutional context (i.e. the 'heightened level of acceptability of economic and social planning by government)' at the end of World War II, exemplified by the New Deal projects of the 1930s;

(2) intellectual developments concerning the legitimacy of state economic planning (e.g. a new synthesis between Keynesian and neo-classical economics, focused on government policy and planning in economic matters);

⁷⁹ *Op. cit.* pp. 170–182.

⁸⁰ D. Hodgson, 'Orthodoxy and revisionism in American demography', *Population and Development Review*, 14 (1988), pp. 541–569, and S. Szreter, 'The idea of demographic transition and the study of fertility change. A critical intellectual history', *Population and Development Review*, 19 (1993), pp. 659–701.

(3) The formulation of transnational institutions for the rational management and co-ordination of world political and economic affairs, as in the United Nations. Transition theory provides a general historical model of how all current and emerging colonial and non-European societies could be placed in rank order, and an evolutionary typology constructed:

‘the idea of demographic transition has continued to provide both a ready-made rationale for political activism and a convenient projection tool for forecasting demographic futures under varying assumptions, as to policy effectiveness.... It is this utility for the family planning industry that helps to explain the survival and persistence of the idea for demographic transition.’⁸¹

Demeny has asserted that there has been a ‘prostitution’ of demography when it was used to serve the interests of international family planning programmes. He draws a distinction between scientific and policy research and finds that recently demography has increasingly been attracted by the latter, a decision that ‘their task is not just to interpret the world, but to change it’.⁸²

I can testify from personal knowledge that the founders of transition theory were not at first attracted by its policy implications, but by its scientific value. However, Szreter finds that:

‘demographic transition theory was itself a product of a particular conception of social science as at one and the same time, an engine for investigation and for prediction and guidance for social change’.⁸³

Increasing attention has been devoted to the philosophical basis of transition theory. Thus, Szreter asserts that ‘the aim of scientific explanation and its methods is therefore understanding only and not prediction or ‘control’. He finds that Notestein, Davis, and their colleagues ‘in the immediate post-war generation were already speaking the same epistemological and methodological language as policy scientists and administrators.’⁸⁴ Natural scientists especially, and others might find this historian’s interpretation rather surprising in that the true test of any scientific theory lies in its capacity to predict.

In Szreter’s view there is need for an accumulation of patient, carefully conceptualized investigative projects that study fertility changes in specific communities, where the form that fertility change takes is not prejudged, as is done by those who subscribe to the idea of fertility transition.

‘to understand changing fertility requires the historical reconstruction in specific contexts of the varying ways in which changes have occurred in the perceived relative costs of child-bearing.’⁸⁵

One wonders whether increasing numbers of studies will provide many new answers for the macro-trends used in transition theory.

CONCLUSION

The demographic transition was born a lusty infant some 50 years ago. With all its shortcomings, it remains at the centre of the demographic stage. In this review I have attempted to show the stage that the transition has reached, and the diverse approaches to causation: socio-economic, economic, institutional, cultural, ideational, etc. Inter-

⁸¹ Szreter, *ibid.* p. 686.

⁸² P. Demeny, ‘Social science and population policy’, *Population and Development Review*, 14 (1988), p. 455.

⁸³ Szreter, *loc. cit.* p. 689.

⁸⁴ *ibid.* p. 691.

⁸⁵ *ibid.*, p. 692.

estingly, none of these meet the demand for specificity in regard to the timing and speed of the transition, in spite of the fact that this was a common criticism of the classic formulation of the theory.

No two countries have followed identical paths to transition, because there are so many possible combinations of nuptiality, fertility, mortality, and migration at each stage of the transition. However, this diversity is not irreconcilable with the universality of the transition. As Notestein said more than 40 years ago 'it is impossible to be precise about the various causal factors' behind the fertility transition'.⁸⁶ The heterogeneity of explanatory frameworks in the national monographs of the Princeton European Fertility Project is impressive. But, as pointed out in the conclusion of this study, the differences are not so great. They may accelerate or delay the transition, but the transition itself is inescapable.

Demographers and others in search of causality are dealing with a very complex and highly interrelated structure of causation that at times seems nebulous. Perhaps, as Chesnais says, like so many areas of human behaviour, mortality and fertility cannot be resolved into an equation with a few quantifiable parameters.⁸⁷ Concepts such as individualism, freedom, and self fulfilment are difficult to quantify meaningfully. It is true that a few authors, like Lesthaeghe, have made impressive efforts in this field.

It is tempting to suggest that it was the decline of mortality which led to the disequilibrium that triggered not only the fertility transition, but more than anything else reduced the shackles of fatalism which lay behind secularization, the rise of the modern economy, and even the knowledge explosion.

Perhaps most promising for transition theory is an equilibrium or homeostatic framework. Demographers and others have too often limited their analysis of the origins and extent of conscious control on marital fertility. There are many other possible social adaptations to population size, particularly rules which govern the extent and timing of marriage, sexual abstinence, length of breast-feeding, rules relating to the remarriage of widows, migration, and infanticide (either direct, or by neglect). However, as Hirschmann has said: 'conscious patterns of fertility control are an important part of the process, but the theoretical framework of transition should be built on a broader base.'⁸⁸

In a sophisticated study Lee has discussed the evidence for the existence of homeostasis in historical populations: the nearly stationary populations of hunting and gathering peoples, the rapid growth of frontier populations, recovery from demographic crises, population growth following economic progress, the correlation between fertility and the size of landholdings, and especially the long-term swings in European historical populations. According to Lee, demographic homeostasis has changed since the nineteenth century. The influence of what he describes as 'population density' has been greatly weakened. The positive relation with fertility no longer exists.⁸⁹

In the perspective of really long-term swings in the past, perhaps his view of the present century may be short-sighted. He could follow his own advice and look at really long-term swings. After all, the demographic transition has yet to play itself out.

Application of the homeostasis principle could lead to a better understanding of what post-transition levels of fertility are likely to be. I venture to guess that the present level of fertility in Europe, below and in some cases well below replacement level, is an over-correction that will be modified. As children become scarcer their value rises, both

⁸⁶ *Loc. cit.* in fn. 11.

⁸⁷ *Op. cit.* in fn. 68, p. 409.

⁸⁸ *Op. cit.* in fn. 32, p. 227.

⁸⁹ R. D. Lee, 'Population dynamics of humans and other animals'. *Demography*, 24 (1987), pp. 443-465.

economically and psychologically, There is already mounting concern about the ageing of the population which is a result of low birth rates. It can be expected that public attitudes and governmental actions will give expression to this view in pronatalist measures. To me it is surprising that so little has been published on this topic in Western Europe, except in France.

In Western areas of low fertility we are moving into a post-transition era, where the old guidelines are no longer appropriate, an era in which much more attention will have to be given to raising fertility, rather than to lower it.

It is thus quite possible that, as many of the founders predicted, the world's population will approach a new equilibrium of births and deaths. True, in the world as a whole this cannot be expected to happen for many years as the transition runs its course in all parts of the world. What happens after the transition is the most exciting problem in modern demography, for which transition theory can provide some guidance but few answers, as it is tied to a particular epoch of history.