Malthus: There and Back from the Period Preceding the Black Death to the "Industrial Revolution"

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> Itaque comparationibus haec omnia discuntur. Inest enim in comparandis rebus vis, ut quid plus, quid minus, quidve aequale adsit, intelligamus.
> Leon Battista Alberti
> (*De Pictura*)

Even just before 1950 it was not good form to quote the predictions Thomas Robert Malthus made at the end of the eighteenth century without making some cutting remark. Had he not forecast a terrible, inevitable demographic catastrophe caused by a mechanical process relating to the gap between the size of the population, which increased in a geometrical progression: 1, 2, 4, 8, and the size of its means of subsistence, which increased only in an arithmetical progression: 1, 2, 3, 4...? The process would end inevitably in famine, starvation, death and a holocaust. The subsequent years immediately and scathingly contradicted him: Malthus had not foreseen the "industrial revolution" which was to bring about a rapid, strong and large-scale growth in the population. The Anglican priest had been on the wrong track[1].

[1] Malthus' theory will be discussed more fully later in the article. Here we refer only to its most famous assumption and the one that is most frequently debated. It goes on as follows: 1,2,4,8,16,32,64,128,256,512 on one hand; 1,2,3,4,5,6,7,8,9,10, on the other hand, so that in 225 years the ratio of population to food would be 512:10 and in three centuries 4096:13. Malthus refrained from going further, declaring that after 2000 years the ratio would be incalculable. The argument appeared a second time in the *Essai on the principle of population* in a more direct and striking form for the British. Malthus took the example of a starting population of 7 million (that was what he attributed to Britain) which doubled every 25 years. At the second doubling, there would be a population of 28 million but there would be food for only 21 million. At the third doubling, there would

Nowadays, sarcastic remarks about Malthus are no longer heard. He has not been recognised as someone with foreknowledge of the future - at least in the West - but modern scholars have discovered profoundness and perspicacity in his analysis of the past. The infernal cavalcade had just about stopped only in Malthus' time: until then it had raced well and truly. People had been caught prisoners in a trap which had mercilessly and periodiacally snapped shut when the total population had reached the level or gone above that of the resources they required to live. The production methods which would have enabled men to stave off the curse had failed to appear. They were just emerging. According to the shock formula, Malthus had been born too late in too new a world[2]. Save in this, his qualities as an observer and a dialectician (or a logician) were worthy of admiration. One only needed to shift his speculations slightly backwards in time for their pertinence and evidence to dazzle. The Malthusian impasse had governed Europe relentlessly for more than 400 years until the day and the miracle of deliverance. From this angle and in this light, Malthus escaped criticism and his reputation was fully recovered.

This version enjoys a large consensus of opinion that has gone beyond England to many circles abroad, notably in France. The global population explosion we have experienced has made no small contribution to its success, awakening widespread fears about over-population and the using up of Nature's resources. Part of the earth is still caught in the trap from which Westerners escaped about 200 years ago. So is the change of opinion about Malthus justified? How has it been possible? How has it happened? Examining these questions has not seemed a waste of time. It has led to discordant results that by degrees have affected other much-

be a population of 56 million , but food for only 28 million. At the fourth doubling, therefore after 100 years, the population would number 120 million but there would be food for only 35 million! Malthus' theory was the subject of an international conference held in Paris in 1984. Some of the papers that dealt with different aspects of the subject have been published in *Malthus Past and Present* (London,1983) and in *Malthus, hier et aujourd'hui* (Paris, 1984), both edited by Antoinette Fauvé-Chamoux. Biographies and general studies are to be found in Patricia James, *Population: Malthus, His Life and Times*, (London, 1979) and William Paterson, *Malthus*, (Cambridge, Massachusetts, 1979).

[2] cf. Emmanuel Le Roy Ladurie, *Les paysans de Languedoc*, (Paris, 1966), p.654. E. A. Wrigley expressed the same opinion on several occasions, especially in the *Actes du Colloque* quoted above: Malthus was a model for pre-industrial economy.

debated areas concerning development, including the problem of the "industrial revolution". The following pages retrace the steps of the enquiry and ultimately deliver the conclusions which we deem have emerged from it. It goes without saying that they remain subject to careful reflection and to counter-evidence.

1. Malthus and the Black Death

Although reluctantly, the American historian J. C. Russell was responsible for the re-launching of Malthus' theory. About the time of the 600th anniversary of the Black Death, in 1948, there was much debate about how severely the plague had affected the population of England. It was Russell's idea to measure its impact by examining the size of the population before and after the epidemic. Two fiscal documents were available to him, one fairly remote from the other, but he judged them nevertheless able to supply the information he was looking for if he handled them appropriately. The older document was the Domesday Book of 1086: from this, he calculated a population of 1,400,000. The second document consisted of the rolls of the Poll Tax levied in 1377: from these, he calculated a population of 2,235,000. Between these two dates, the population of England had risen rapidly for many years, had suffered the disaster of the Black Death and then had fluctuated somewhat. After much cross-checking and reflection, J, C, Russell fixed the population before the Black Death at 3,700,000. And so, thanks to his research and calculations, historians were no longer floundering in an impressionistic, literary haze, but now had a definite figure to work on. Russell's research was enthusiastically received. However it was soon overshadowed by further considerations made by the English scholar M. Postan, using the same data[3].

When Postan read Russell's conclusions, he was reminded of a book published some 30 years previously, and of its theory. The author, A. Levett, studying the estates of the Bishopric of Winchester, had pointed out the devastating effects of the food shortages in the first half of the fourteenth century and, in particular, of the Great Famine of 1315. Levett maintained that the

[3] J. C. Russell, *British Medieval Population*, (Albuquerque, 1948).

way had been cleared then for the Black Death whose intrinsic harmfulness consequently needed to be reconsidered[4].

Postan put this theory alongside Russell's suggestion of a large population and was suddenly struck by a revelation: events had happened exactly according to the process Malthus had described in 1798. The population, which had grown continuously since the beginning of the eleventh century, had at a certain point exceeded its effective possibilities of sustenance. Hence the decline in population before the Black Death, a situation that lent itself to the subsequent outburst of the plague. Postan backed up his theory by re-examining Russell's figures and suggesting that the population at its highest numbered 7 million, almost twice Russell's estimate. The small size of the plots the English peasants farmed had seemed to him further evidence of a large population. The wheat yield in the Bishopric of Winchester, reported by J. Z. Titow, advised caution. Yields were low: 10.8 bushels per acre i.e. 9.48 hectolitres per hectar on average between 1211 and 1350, insufficient to sustain a continued increase in population, or indeed to sustain the population as it stood [5].

Postan's theory was less solid than it seemed. It was based on the same documents that Russell had used. Because of the way they were drawn up, and because of their distance in time from each other, the Domesday Book and the Poll Tax rolls left a huge margin of interpretation. This was used in both directions: Russell's estimate was raised, Postan's estimate was lowered [6]. Scholars were not convinced by either: in the end no solution was agreed upon. John Hatcher

[4] A. Levett, *Black Death on the Estates of the Bishopric of Winchester*, (Oxford, 1916).

[5] M. Postan, 'Some economic evidence of declining population in the Middle Ages' (*Economic History Review*, 1950, pp. 221-256), taken up again in *The Economy and Society: An Economic History of Britain 1100-1500*, (London,1972) - J.A. Titow: *Winchester Yields. A Study in Medieval Agricultural Production* (Cambridge University Press, 1972).

[6] Problems posed by the Domesday Book include the absence of many counties and towns; the option of a single landholder per farm (without taking into account subtenants); uncertainty about the coefficient used per family unit: 3.5 or 4.5. Problems posed by the Poll Tax (1 groat or 4 pence per individual taxed) included the amount of tax evasion (5% for some, 15% for others); the number of people not liable to tax; the number of people under 14 years of age (not included in the census). The estimate of an increase before 1086 and a decrease between 1348 and 1377 remains problematic.

suggested the population at its height was at least 4.5 million and at most 6 million, and confessed he leaned toward the latter figure. But food put a spoke in the wheel as far as these conjectures are concerned. One of the latest authors to touch on the question challenges outright the higher estimate for reasons of congruence with economic conditions, and confines himself to a number between 4 and 4.5 million. All the same, some historians harked back purely and simply to Russell's estimate of 3.7 million. Matters are further complicated when we see how figures taken from the Domesday Book are sometimes raised to 3 million: if these figures were used, population increase would be considerably reduced[7]. A similar change affects our opinion of the economy. It has been ascertained that Hampshire, the county in which the estates of the Bishopric of Winchester were to be found, was one of the least productive in England, and B. M. S. Campbell discovered in Norfolk yields of 16 bushels per acre i.e. 14,05 hectolitres per hectare in the period under examination. Without going from one extreme to the other, we should acknowledge the need for a re-examination[8]. Lastly, the small size of plots refers back to the social context described by several historians, both in France and in England. We shall not comment on it, but it remains in abeyance for the moment[9].

It appears now that Postan's fundamental intuition, his

[7] The following works have been consulted: J. Hatcher, *Plague. Population and the English Economy 1340-1530,* (London, 1977); J. E. Bolton, *The Medieval English Economy 1150-1500,* (London, 1988); H. E. Hallam, *Agrarian History of England and Wales*, volume II (Cambridge, 1988); R. A, Houston, *The Population History of Great Britain and Ireland 1500-1750,* (London, 1990); E. Miller, *Agrarian History of England and Wales* (Cambridge, 1991); M. Overton and B. M. S. Campbell, 'Production et productivité dans l'agriculture anglaise 1086-1871' in *Histoire et Mesure*, 1996, volume XL, pages 255-297. J. Hatcher was mainly concerned with development after 1377. The link-up with the book by E. A. Wrigley and R. S. Schofield, *The Population History of England 1541-1871. A Reconstruction,* (London, 1981), still presents difficulties.

[8] B. M. S. Campbell: 'Arable Production in Medieval England: Some Evidence from Norfolk' in *Journal of Economic History*, 1983, pp. 379-406; Kathleen Biddick and Catrien C. J. R. Bijlevelt, 'Agrarian productivity on the estates of the Bishopric of Winchester in the early XIIIth century: a managerial perspective' in B. M. S. Campbell and M. Overton: *Land, Labour, Livestock: Historical Studies in European Agricultural Productivity,* (Manchester, 1991).

[9] This refers us to the debates about feudalism, particularly those centred on R. Brenner's theories in England and G. Bois' in France. The reference is merely *pour mémoire*.

supporting a Malthusian interpretation of the fourteenth century, suffers from an incomplete and hasty verification. Gregory Clark criticised it with regard to the food requirements of the population[10]. Such criticism may be taken further. Let us first consider the figure of a population of 4.5 million, and each person's average ration of a "quarter" - 2.8 hectolitres - a figure long accepted as normal in England and, in any case, biologically sufficient. Now let us turn to J. Z. Titow's poor yields. To ensure the population's cereal requirements in a normal year, 3.4 million acres would have had to have been cultivated. Mark Overton calculated from his research that 6.8 million acres were under cultivation in 1300, double the above figure. If calculations were based on the maximum population figure, 6 million, 5.5 million acres would need to be cultivated in order to feed the population - an area still smaller than that actually engaged in cereal cultivation. The advantage would merely become more marked as yields changed, however slightly[11]

It is of little importance here to discuss the quality of the cereals, their respective weight and proportions in diets, the gross and net yields and so on: the evidence points to a situation that was not at all disastrous[12]. This refers of course to normal circumstances - a good

[10] G. Clark, 'The Economics of Exhaustion, the Postan Thesis and the Agricultural Revolution' in *Journal of Economic History*, 1922, pp.61 *et seq.*

[11] We have taken as the basis for our calculations a quarter per head, i.e. 2.81 hectolitres per head: an overall average often proposed in English research and sufficient for biological needs. We have taken into account all cereals (wheat, rye, oats and barley): this decision is justified in that diets differed in England from one region to another and from one class to another. These differences continued with some modifications until the eighteenth century. G. Clark based his calculations on 1.68 quarters per head, including the cereals that in theory were destined for animals. Even with these figures we would still be within the limits of the possible, although only just. There is still a lot of uncertainty about animal-rearing in the Middle Ages: it would seem to be based more on grazing and hay than on corn.

[12] A calculation made with the figures of the net yields produced by B. M. S. Campbell and M. Overton in the article quoted gives a quota of 4.60 or 5.23 hectolitres of all cereals per head according to the maximum and minimum estimates of the population - 4.5 or 4 million. If we apply J. Hatcher's highest estimate of 6 million, the quota would still be 3.48 hectolitres, within biological norms. Of course, we could argue about the equivalent in weight but, on the one hand the norm of convention leaves plenty of margin in the estimate and, on the other hand, we have taken into account only cereals and not other foodstuffs such as beans, peas etc. Lastly, the physiological requirements of people in the thirteenth century have not been fully determined.

year for English peasants. A bad harvest would bring about a notable deterioration. By incriminating over-population and a Malthusian mechanism in his observations on food shortages and the damage they wrought at the beginning of the fourteenth century, Postan ignored the risks involved in crop-growing and begged the question. In 1315 and 1316, yields in the Bishopric of Winchester fell to about half their average quantity. We can imagine that people complained they were starving, especially the poor and those with little security who were scourged by the lack of food and high prices[13].

In short, instead of discovering the real causes of poor harvests and the spread of disease, Postan's research put forward a theory that had the prestige of a great "classic" which seemed closely reasoned but which lacked concrete documented references. There is no doubt that he acted in innocence, but here we have falsification in the epistemological sense of the word. The accusation becomes more serious if the bad harvests are moved back to 1290 or 1280 as H. E. Hallam and, to a greater extent, R. S. Gottfried suggest[14]. The decline in the Black Death's virulence, as implied by the neo-Malthusian theory applied to the fourteenth century, does not better withstand examination. Originating in Mongolia, the plague crossed deserts and sparsely-populated regions, slaughtering everywhere. People did not need to live in crowded conditions to fall victim. Nor did they need to be particularly deprived to be affected, as was proved in London and Amsterdam where the plague attacked again in 1664[15]. However

[13] The existence of "breakdowns" in production may be seen in the yields reported by J. Z. Titow. On this subject, see the latest book published: W. C. Jordan, *The Great Famine. Northern Europe in the Early Fourteenth Century,* (Princeton, 1996).

[14] R. S. Gottfried: *The Black Death. Natural and Human Disease in Medieval Europe,* (New York - London, 1983).

[15] On the contrary, sparsely-populated regions were also affected by the plague. Without dwelling on the deserts of Central Asia across which the plague swept, leaving a trail of victims, we should mention Sardinia, the subject of J. Day's research. Was this a contradiction of Malthus' theory? See J. Day's article on chronic under-population and demographical calamities in Sardinia in the Early Middle Ages in *Annales E. S. C.*, 1975, pp. 684-702. I would like to thank my colleague Henri Bresc for having drawn my attention to this article. The classic works on the plague are J. F. D. Shrewsbury, *History of the Bubonic Plague in the British Isles.* (London, 1970) and J. N. Biraben: *Les hommes et la peste en France et dans les pays européens et méditerranéens,* (Paris, 1975).

rectification does not totally annul the aggravating factor of a high-density population. Infection travelled better in densely-populated environments, especially when they were inhabited by a crowd of destitute wretches. But this is only distantly connected to Malthus' theory. It is different. Postan was wrong to cross that at times not very visible but still existing line which separates pauperisation from universal exhaustion and hyperpopulation from apocalyptical overpopulation[16].

Hanging on to Malthus' coat-tails, Postan let slip a very important observation. Let us take a look at what happened to population growth between 1086 and the beginning of the fourteenth century (roughly speaking). It is growth that took place in the interim. This is undisputed, whatever annual coefficient is attributed to it. It happened in an economic climate about which we do not know everything, but one which certainly did not have the developments and progress characteristic of the nineteenth century. An *ancien régime* growth, if we want to keep this expression which stands alongside a population trend, officially called an *ancien régime* trend, that is depressed, stagnating and only just saved from decline. The model for this latter trend had been taken from the early studies on the Parisian Basin in the seventeenth century[17]. Vocabulary, names and, most importantly, the idea of development must be revised. The existence of population growth within a temporal and economic *ancien régime*, and its compatibility must be acknowledged. In this light, the researcher would be well-advised to discern several phases and styles in this *ancien-régime*. In Phase A and Style A, for example, during the eleventh, twelfth and thirteenth centuries, life prevailed over death, despite the conditions in which the contest took place. Phase B and style B began with the Black Death or shortly before it, and were characterised by a series of crises and a sharp fall in

[16] A. Sauvy *et al.*, *Dépeuplement rural et peuplement national*, (Paris, 1949).

[17] Both the name and the concept owe a lot to P. Goubert: *Beauvais et le Beauvaisis de 1600 à 1730* (Paris, 1960). Goubert has always refrained from imposing a model that is applicable to everywhere in France. Cf. his paper in *Hommage à Ernest Labrousse* (Paris, 1974): "Sociétés rurales françaises du 18e siècle. Vingt paysanneries contrastées. Quelques problèmes." Also M. Morineau: "Démographie ancienne; monotonie ou diversité des comportements" in *Annales E. S. C.* 1965, pp. 1185-1197.

population: this continued in England until about 1440. Phase C and style C followed the afore-mentioned phases in England and controlled population development throughout the second half of the fifteenth century. There was neither growth nor a catastrophic fall, a situation which, although not stable, was at least constantly re-balanced, though not flourishing; in short, the above-mentioned *ancien régime*-type population, which no longer enjoys its usurped status as a unique model. This division into three phases and styles is, in our opinion, the most pertinent, the one that adheres closest to events and allows us to regroup them in order to make an accurate in-depth analysis[18].

Postan's work influenced medievalists enormously, all the more so in that counter-evidence was not produced until much later, quite recently in fact. The majority of medievalists were affected by the growth they had recorded in different sectors between the eleventh century and the beginning of the fourteenth century: land clearances, the building of *bastides*, the growth of large towns. In view of the assumed population boom and then the sharp decline during the Black Death of 1348, it was tempting for them, with the aid of Postan's work, to flirt with a Malthusian interpretation. Certain scholars were more or less openly of this opinion. However, like Malthus, they had no formal evidence of over-population and an irremediable dwindling of food supplies [19]. Like Malthus, they tended to ignore "accidents" in the harvests and to favour a more academically lofty explanation. This can be seen most clearly in Emmanuel Le Roy Ladurie's studies on the fourteenth-century crises in Languedoc. He begins by writing of the "mighty multiplication of the population", a demographic tide, confirmed by the *Etat des feux* in 1328 - an invaluable document in itself - and then writes of the "excessive dividing up of estates". Le Roy Ladurie professes an act of faith in Malthus without any concrete verification of its correctness. He goes on to list the

[18] The reoccurrences of the plague and the other epidemics after the Black Death have been examined by J. Hatcher, *op. cit.*. E. A. Wrigley and R. S. Schofield, *op. cit.* p. 736, have attempted to go back to 1446.

[19] There is a certain contradiction in the works of medievalists about the progress they describe: urbanisation, industrialisation and the development of trade, which seemed to be on a par with deterioration.

famines that struck the province before the Black Death's advent: 20 famines in 46 years, some of which occurred in 3 or 4 consecutive years. Malthus is not mentioned - he will be mentioned later in the main thread of the argument - but the entire text is already couched in Malthus' theory. Le Roy Ladurie connects food shortages with a large population and does not link them with climatic and metereological conditions. The Black Death spread over prepared terrain. In fact, this description repeats the description we have seen of the situation in England, although it perhaps paints it somewhat blacker: a phase A and a style A, probably already eroded from the outside, if not corrupted, in the late thirteenth century and the early fourteenth century, followed by a phase B and a style B that led to the lowest ebb about 1440, as elsewhere, before becoming phase C and style C. The periods and the changes are almost identical. Studying a wider field, Philippe Contamine was more prudent, although he remained of the same opinion[20].

2. Malthus in France (Languedoc) in the Modern Era?

Studying the implications of Malthus' theory was not among the priorities of the first demographic historians. They had a different idea of Malthusianism which they had got from the pure demographers of the early twentieth century: that idea which may be briefly summarised as contraception or birth-control. The centuries before the establishment of the lay registry office during the French Revolution and the nineteenth century population censuses were almost totally *terra incognita*. Therefore the first task was to try and reconstruct this past and Jean Meuvret, his pupil Pierre Goubert and René Baehrel, to mention only the main researchers, proceeded to do so. Parish registers constituted the favourite material for research. They enabled researchers to go

[20] E. Le Roy Ladurie includes in his bibliography only one article by Postan, published in the *Economic History Review* in 1938, before the open controversy with J. C. Russell and his application of Malthus' theory to the fourteenth century. However, it is improbable that he had not read the article published in 1950. He did admit that he did not bother to draw up a *tabula gratulatoria* in the *Paysans de Languedoc*. Concerning Philippe Contamine's position, see *Economie Médiévale*, (Paris, 1993). J. C. Russell always vehemently refused to adopt Postan's opinion.

back two centuries. They revealed the spasmodic nature of development in the seventeenth and in part of the eighteenth century. Whence the aforementioned concept of a demographic *ancien régime* or alternatively of an *ancien régime*-type demography, or an ancient demography[21]. Attention was then turned to the attenuation and, on occasion, the disappearance of this form of global behaviour, which was correlative to unshackled growth. Once this was recognised, its cause had to be sought. Most, indeed all, scholars agreed that it was due to a change in agriculture, an "agricultural revolution". Intellectually, the next step was to bring in Malthus' theory: growth was strangled because of recurring food insufficiency, and then the population increased again when agricultural fetters were broken. This was stated in E. Le Roy Ladurie's book, *Les Paysans de Languedoc*, published in 1966. He enlarged on this theory a few years later, instigating nation-wide research on tithes. Le Roy Ladurie himself interpreted the results of the research fairly freely: they seemed to him to fit his earlier theory. He thus became the leader of those historians who favoured a Malthusian interpretation in France and for pre-nineteenth-century France. Consequently we shall now retrace his steps to verify the truth of his theory, although we shall go on to integrate it with later research produced by other specialists[22].

We have seen E. Le Roy Ladurie's succinct treatment of the population decline in Languedoc: in short, he merely transferred Postan's description of England to Languedoc. The essential part of his proof did not lie here. It was in his observation and analysis of development in the modern era, and especially in the sixteenth and seventeenth centuries, with a sort of *post-scriptum* for the eighteenth century. The period is presented both as one when demographic

[21] Historiography of the development in J. Dupâquier, *Histoire de la population française*, (Paris, 1988).

[22] This stand taken by Le Roy Ladurie was challenged by M. Morineau in "Histoire de dîmes ou de quoi subsister jusqu'à la saison prochaine", published in the collection *Pour une histoire économique vraie*, (Lille, 1985), and before that, in English, in the *Journal of European Economic History* (1981) with the title 'History of Tithes'. He later changed his stand in the discussions concerning the absence of an "agricultural revolution", although he never went so far as to withdraw his early statements. We shall not deal with this subject here, but only with population growth and its Malthusian connotation. We shall confine ourselves mainly to the situation in Languedoc.

development was checked and one with a "great agrarian cycle", a period of ultra-conservatism. This ultra-conservatism was responsible for the halt in population growth but was ousted about 1750, and subsequent progress triggered a "real growth" which was to last and could spread practically *ad infinitum*. The *Paysans de Languedoc* had an undeniable appeal because, thanks to new documentation, it included the sixteenth century in the demographic analysis, which had never happened before. The study of population development became more wide-ranging and therefore more fascinating. The book's felicitous style did not prevent it being admired - quite the contrary. But what kind of proof is presented? Is it strong enough to inveigle the reader to agree with Malthus' theory, which the author and maintains and endorses?

Several types of document are used. For the sixteenth and the early seventeenth centuries, E. Le Roy Ladurie used *compoix* from Languedoc - land registers of a village or a town, listing landowners, which were published and up-dated periodically, and books of those liable to tallage or of heads of family that were drawn up for every community. To these he added for the seventeenth and the eighteenth centuries parish registers analysed by mere enumeration, lists of communicants and diverse indications. The last group of data is well known and deserves no comment other than the usual one: the grouping of data according to families had not yet begun, and we cannot complain about its absence[23]. On the other hand, the acuteness of cadastral demography has been contested. Georges Freche had done research on Languedoc in the same period[24]. He, too, was very familiar with the *compoix*, and he refused to acknowledge them as accurate representations of demographic development. The increase in the number of plots of land in the fourteenth century was evidence of a social development; it was evidence of more apportionment and was not systematically evidence of a parallel and equal increase in

[23] The method was perfected by Louis Henry and M. Fleury, *Nouveau manuel de dépouillement de l'état civil ancien*, (Paris, 1965) and L. Henry, *Manuel de démographie*, (Geneva - Paris, 1967).

[24] G. Frêche, "Dénombrement des feux de 2793 communautés de la région toulousaine" in *Annales de Démographie Historique*, (1968), pp. 389-421, and 1969, pp. 393-471.

population. However, the lists of those liable to tallage lay themselves open to criticism too. This was on account of a phenomenon that was very frequent in the fifteenth century: *frérèches* - groupings of several households under one roof and one authority. Only one person could assume the function of head of family, i.e. the patriarch, who automatically substituted two, three or even four of his subordinates. In these conditions, the supposed decline in the population would not reflect reality, and population figures would have to be raised if reality were taken into account. Inversely, the slackening of ties in the sixteenth century, and the fact that adults who were previously kept in the background in subjection became self-sufficient and responsible could provide the key to some population growth.

Unfortunately, these disputes have not been settled and cast a shadow on the dimensions of the population growth referred to. We do not have to commit ourselves on the subject here. We shall retain the figures put forward by E. Le Roy Ladurie to discuss his interpretation, despite any just reservations we may have about their correctness and the intensity of movement they imply[25]. According to Le Roy Ladurie, the pattern of events was as follows. Population levels remained low for quite a long time in the fifteenth century, and in places even in the early sixteenth century. Then, sooner or later according to the locality, there was a "population explosion" in Languedoc. Population figures doubled between 1500 and 1570. In that year there was a halt which was not destined to last long. The population began to increase again until 1670, when growth stopped again. This time the halt was more serious: the province did not recover from it until the mid-eighteenth century.

E. Le Roy Ladurie's comment is simple. Languedoc experienced a "Malthusian renaissance" from the end of the fifteenth century onwards i.e. an imperfect renaissance, chopped up into segments of growth, crises of over-population and of exhaustion and times with a very high death-rate. This "renaissance" spanned two centuries or just over two centuries. About 1750, an agricultural revolution improved

[25] *Compoix* were drawn up at different times in different villages, which complicates the issue somewhat awkwardly. Cf. *Paysans de Languedoc*, pp. 189-196.

living conditions and triggered population growth. This growth was not at all like the previous era's episodical spurts. It was self-sustained and lasting. It was 'real growth'. Malthus had been right when he referred to ancient, traditional societies; he had been wrong when he referred to those societies that had begun in his lifetime. He had been "a prophet of the past"; he had been born too late in too new a world. We have brought the account to its conclusion. The exordium is elegant, but let us now take a look at the facts.

We shall take the different parts one by one. The sixteenth century is presented ambiguously. At times, on page 193 *et seq.*, population growth is seen to continue until 1570, thereby giving good grounds for the expression, the "beau XVI siècle". At other times, on pages 222, 319 *et seq.*, "a profound crisis" sets in from 1530, after which "nothing was the same any more": the "beau XVI siècle" shrinks to thirty years earlier[26]. A Malthusian explanation is implied in both cases. In fact, a Malthusian explanation ill applies to both these dates. It does not apply to them at all.

In 1530, population growth was still new. It had been tardy and had been spread over the period from 1480 to 1520. Starting from such a low, the population level in so short a period could not have reached such a high that it exceeded food-supplies, especially since the peak of the fourteenth century was still far off. All the more so in that growth had taken place during the difficult years. Bad harvests and famine had been relatively modest from 1460 to 1504, a period defined by E. Le Roy Ladurie to explain the improved situation. Bad harvests and famine had increased between 1480 and 1530: there were over 25 bad harvests in 50 years - a sad record, very like the situation in Languedoc shortly before the Black Death. In view of this sorry combination of circumstances, it is rather superficial to write of a "growth crisis", or, even worse, of "poor growth" to account for a situation that is self-explanatory; to do so is to be co-responsible for Postan's and Le Roy Ladurie's mistakes concerning the first half of the sixteenth century, with even less evidence and fewer pretexts. There is no doubt that man was not yet master of the land in 1530: food was available if climatic and

[26] In his book *Le Siècle des Platter*, volume I (Paris, 1995), E. Le Roy Ladurie has seemed to opt for the early sixteenth century as having been the 'Beau XVI siècle.

meteorological conditions were favourable. Frequent famines - that ever-present sword of Damocles - incidentally posed the problem of the rate and size of growth. There is no mystery about the final conflagration, the outbreak of a plague epidemic - for that was what it was again. The plague once more justified its fame as a killer. To crown all, it "romped" for several successive years, always in collusion with bad harvests. From this angle and in this light, the "beau XVI siècle" proves rather pitiful[27].1560 and 1530 were the most fitting dates to support a Malthusian theory. Population growth had leapt up after 1530. It had been favoured by a climatic bonanza. Population levels had risen. Strangely, E. Le Roy Ladurie showed reserve at this stage of his book. He refused to blame the economy, preferring to blame an event-linked factor: the wars of religion, whose responsibility was suggested rather than demonstrated. It is true that indicators of population are very often unreliable. We can compare the population between 1550 and 1575 with that at its peak in the fourteenth or thirteenth century in one place only: the small town of Lunel. It had 737 inhabitants in 1575 as against 891 in 1295. If we are to judge by legitimate calculations, there was no recovery in the province as a whole either. This finding urges us to consider growth relatively and to refrain from talking about saturation [28]. The biological exhaustion of individuals which would have been expected as a corollary of Malthusian theory is belied by comparing journeymen's rations at a century's interval, in 1480 and between 1580 and 1590. The quality had deteriorated: wheat had been replaced by rye, but the quantity had not diminished. When everything is taken into account, including other foodstuffs, a man at the end of the sixteenth century had a higher daily intake of calories than his great-great-great-grandfather: 4917 calories as against 4164 calories. To explain this

[27] M. J. Larenaudie, "Les famines en Languedoc aux XIVe et XVe siècles" in *Annales du Midi*, (1952). For the *Paysans de Languedoc*, see p. 317 *et seq.* The contradiction appears on pages 321-322. At first it is a question of "ten years of lean cows" (1526-1535), and then of a Malthusian crisis: " the 1526 crisis is therefore a "growth crisis" but a "poor growth crisis" ...

[28] In fact, the population figure for Languedoc in 1657 was more or less the same as that in 1698, which we know, and refers back to that of 1328. The population had increased since the end of the sixteenth century. Lunel in the *Paysans de Languedoc*, *op. cit.*, pp. 143, 190 and 194.

away because of the wars (an explanation which is not verified and of course cannot be verified) smacks of conformity and ignores a regrettable lack of information. The hard years after 1560 with their bad harvests, famine and a rise in the death-rate were worse than Le Roy Ladurie reported. Several calamities were terrible: in 1565-1566, 1573-1575, 1586 and so on... The fall in population at the end of the sixteenth century is due to this host of natural scourges [29].

To involve Malthus' theory in the population of Languedoc in the sixteenth century shows the same falsification we have noted in the first half of the fourteenth century. Falsification (always understood in the scientific sense) heightened by the fact that the population was still smaller than in 1300. However some extremely precious information had been overlooked. Growth resumption had been a revival of phase A and style A, which had not been seen since the Black Death, a "restoration" following a phase and style B and a phase and style C; which, to be more explicit and run the risk of repetition, means a demographic situation with more births than deaths over quite a long period. Phase A and style A do not imply that the birth rate always exceeded the death rate, but merely that in that period the balance was in favour of births, and when necessary serious crises were absorbed as in 1530, until an accident or, worse, a series of accidents in close succession interrupted this situation. Thus the end of the sixteenth century saw a phase B which did not last long and which was perhaps even mingled with a phase and style C that were just as fleeting. From about 1600, Languedoc had reverted to a phase and style A, which were, however, less robust: without being as extreme. Except during the 1630 plague, the death-rate continued to make its presence felt and to hinder progress (according to figures produced by Le Roy Ladurie). We shall see later that this evolution was not confined to Languedoc but was seen in other French provinces at the same time; the

[29] Annual rations in *Paysans de Languedoc, op. cit.*, p. 267. This does not exclude a certain deterioration in quality (rye instead of wheat): indeed, as everywhere in Europe, less meat was eaten. But deterioration does not mean exhaustion. The damage caused by the Wars of Religion can not be measured by only a few examples. As for the crises following poor harvests, they emerge very clearly in local chronicles and in the market-prices of corn.

similarity was apparent until the final break-down about 1670.

The period that began about 1675 has some contrasting aspects. E. Le Roy Ladurie collected conventional explanations of them and repeated them: the "fall in prices", the alleged money crisis, fiscal surcharge and the sacrifices the population had to make for Louis XIV's megalomania. All affirmations that have not much to do with the matter, even if they are not invented and are not very clear. Let us put them aside [30]. The period began with a fall in population. Now this coincides with a good period for wheat production, unlike previous times when the population fell. A Malthusian explanation is totally inapplicable here. On the other hand, a fact that was not exactly new but that had not been very obvious in Languedoc has been brought to light: the death-rate persisted but there was no shortage of food. The end of the seventeenth century is more classical: here we find again bad, indeed very bad, harvests and a consequent high death-rate. Recovery stumbled against the three tragic years 1708, 1709 and 1710.

Languedoc population then entered a sluggish phase C. E. Le Roy Ladurie maintained that it lasted until about 1750. The evidence he uses as proof does nothing to reinforce his assertion. The graphs of baptisms he published do not bear witness to a marked rise in population. They are challenged by George Frêche's figures: he noted a fall in population in the reign of Louis XVI. According to him, the Narbonnais was in a no better state in the eighteenth century. Recent research by independent specialists from Montpellier ended in disillusion: "Bas-Languedoc seems to have been in a permanent slump from 1677 to 1789" [31]. Growth from 1698 to 1789 registered a mediocre 12%, lower than the "national average of 33%. To crown all, at the end of the political *ancien régime*, the population of

[30] The problems mentioned ought to have been evaluated before being included. The connection between the rise in prices and the arrival of riches from America, and the "depression" or the "temporary breathlessness" of 1530-1545, also called the "inter-cycle", belong to a historiographical tradition symbolised by the names of Hamilton and Labrousse. They figured in 1966 in the list of conditions consistent with, and for some, necessary for the "abortion of capitalism".

[31] G. Freche, *Toulouse et la région Midi-Pyrénées au siècle des lumières vers 1670-1789*, (Paris, 1974); H. Berlan, F. Bocage, E. Pélaquier, F. Rousseau, *Démographie et crises en Bas Languedoc 1670-1880* (Montepellier, 1992); G. Larguier, *Le drap et le grain en Languedoc: Narbonne et les Narbonnais 1300-1789*, (Perpignan, 1996), etc.

Languedoc, numbering 1,799,520, was even less that at its peak of 1670 and may well have only just reached the 1328 figure of over 1,745,645 (if we accept Ferdinand Lot's figures). An "agricultural revolution" was not really necessary to obtain this result [32].

The above remark does not mean that we have a period of "immobilism". Adoptions, adjustments, adaptations, specialisations, transformations: there were too many to list. The important thing is to contextualise them and to assess their significance in each period and in each place. Automatic connections between the economy and demography are to be done away with, all the more so when they are controlled at a distance by an underlying theory. Let us take the example of maize which was introduced into the province in the early seventeenth century. The area where maize was grown did not extend beyond Lauragais and was confined almost totally to Haut-Languedoc. Only a very small amount was grown in Bas-Languedoc because of insufficient rainfall. Consequently, the immediate influence of the new cereal should not be extended unduly, and even in the area affected most directly, maize cultivation was not very widespread. Does that mean that Bas-Languedoc received no benefit at all from the new crop? The peasants of Garonne benefited in several ways. They ate maize and so saved wheat which they passed on to their neighbours along the Mediterranean coast, facilitated by the opening of the Canal Royal des Deux-Mers in 1681, a date that paradoxically is at the beginning of the bad period described above. That could have helped to reduce the need to grow grain among Bas-Languedoc farmers and enabled them to turn to commercial produce that was financially more advantageous. But we must not exaggerate: growth in the province (or in the Montpellier region) still remained modest. And similar halts in growth occurred in the Cévennes and in the Vivarais, despite there being other factors at work. Whatever the economic and demographic conditions of its settlements, Languedoc

[32] Ferdinand Lot, "L'état des paroisses et des feux de 1328" in *Bulletin de l'Ecole de Chartes*, (1929), volume XC. The total number of households counted goes up to 349,129 if the information from the Carcassonne *seneschalsy* is taken into account. F. Lot had made his calculations based on 5 people per household. The seneschalsy of Beaucaire and Nimes had some gaps: "*plusieurs lieux esquiex il n'est faitte nulle mention des paroisses...*". The absence of an "agricultural revolution" does not imply opposition to progress on the land.

experienced only a tiny, infinitesimal progress. E. Le Roy Ladurie's comparison with Catalonia, whose population doubled in the same period, is a big blunder. If we were to persist, the question to ask about Languedoc would not be about a resemblance. It would be why was Languedoc so languid, feeble and jaded? [33].

3. Malthus in France in the Modern Era

E. Le Roy Ladurie was so in love with the "real growth" of the eighteenth century and did not realise how inappropriate it was to refer to "real growth" in Languedoc. So he extended this notion to the whole of France when he did his research on tithes. He concluded that agricultural production - which in actual fact referred to cereal production - had increased by 40% whereas the population had grown by 33%. According to him, the resulting food surplus abolished that fatality which was so inevitable in the eyes of Malthus, and opened up the way for a generalised "real growth". These teachings have carried some weight, and most French historians have referred to them. The idea was accepted all the more readily in that it was part of a vicious circle: for many historians, the existence of population growth required an "agricultural revolution" as a necessary explanation. We shall not dwell on the mediocrity of the French performance in the eighteenth century when France was the second- or third-off-last nation in Europe as far as growth is concerned. We shall likewise brush aside a debate about tithes which had been kept for the enunciation of the theory and which, on verification, seems to have been to some extent solicited for the occasion [34]. Let us concentrate

[33] Cf. G. Frêche, *Toulouse et la région Midi-Pyrénées au siècle des lumières vers 1670-1789*, (Paris, 1974); Maistre, *Le Canal des Deux-Mers ou Canal Royal du Languedoc (1666-1810)*, (Toulouse, 1968); A. Molinier, *Stagnation et croissance. Le Vivarais aux XVIIe et XVIIIe siècles*, (Paris, 1985), confirmed in the reports of the *préfets* during the Empire. For a comparison: P. Vilar: *La Catalogne dans l'Espagne moderne*, (Paris, 1962) and J. Nadal Oller in V. Perez Moreda and D. S. Reher (eds.), *Demografia Historica en España*, (Madrid, 1989).

[34] It is in volume II of *L'Histoire de la France Rurale* (under the direction of G. Duby and A. Wallon), (Paris, 1975) that E. Le Roy Ladurie, after the research on tithes, states his position. On page 395 he writes of an agricultural growth rate from 1700-1709 to 1780-1789 that had a minimum of 25% and a maximum of 40%. On page 582, he states that

on other aspects of the problem, starting with the methodological references.

To speak of growth in France in the eighteenth century in "national" terms was a mistake and has no meaning, from both the economic and the demographic point of view. Regional diversity stood in the way of intermingling, and, though not totally defective, transport in 1789 was still insufficiently developed to ensure an equal partition of resources. Production had varied from one province to another. Tithes did not show uniform patterns and, even if they had done so, a congruence with population development, or rather a superiority, would have had to be verified locally before commending "real growth". The matter called for careful attention. The "national" growth rate of 33% was, like all averages, an artificial figure. It was real in only 5 or 6 cases out of 30 or 40, excluding Corsica. Some other regions showed figures that were at times rather higher - let us say up to 50% - and sometimes rather lower - as low as 20%. Growth seemed very slack when it dropped below 20%, as we have seen in Languedoc with its 12%-15%. But several places, including Alençon, Amiens and Bordeaux had even lower growth rates, touching on zero, and we have not looked for alarming similarities in the fourteenth century[35]. But, in the eighteenth century, there was an enormous contrast with the peripheral provinces in the North and the East, and with Roussillon where the growth-rate was so brisk that increases of 100%, 150% or even 200% were recorded over a century [36]. A

there was a "real growth": "in the last part of this book we have compared the two sectors: the demographic sector (with an increase from 30% to 33% in the eighteenth century) and the production sector (with a plausible growth of 40% in the same period)". We have thus gone from a hypothesis to a definitive certification without testing the minimum, maximum or the elected percentage - figures that concern almost exclusively cereal production - using research on tithes or research based on any other source. Most French historians have taken again the alternative figures but despite counter-evidence have linked them with a "real growth". Their analyses derive essentially, openly or not, from E. Le Roy Ladurie in his final statement, and are otherwise impressionistic with reference to a few examples which were not subjected to a more rigorous scientific enquiry over time and in different areas.

[35] Picardie (Amiens) and Berry (Bourges) were in a similar position to Languedoc, or in an even worse position, with figures lower in 1787 than in 1328. In Picardie, there were 534,128 inhabitants, as opposed to 578,580, and in Berry 550,407 as opposed to 599,175, all according to F. Lot's figures.

[36] The separate figures are to be found in M. Morineau. *Les faux-semblants d'un démarrage économique. Agriculture et démographie en France au XVIIIe siècle*

preliminary mixing of these figures can only present the analysis in a false light: moreover, taking into account regional aspects is commonplace outside France, in Italy, Spain or Germany [37]. So, in view of these differences, what credit should we give to a "real growth" affecting the whole of France to the same degree? In Hainaut, wheat production boasted one of the highest growths seen in France in the eighteenth century, if we are to recognise the validity of the *Taques* of Quarouble and of Onnaing: population growth was even higher. Reports by the prefects of the Consulate and the Empire show that this was true for the whole of the *département* of Nord, which they evaluated as the best in France for the quality of its agriculture. When compared with population movements, tithes do not afford a more reassuring picture [38].

Let us get rid of a model or several models that are unacceptably biased. It would be preferable to turn to better material such as the regional research which has not been altered *a priori* and the research of the *Institut National des Etudes Démographiques* (I.N.E.D.), based on parish registers of births, marriages and deaths. The most eloquent figures and estimates come from Bretagne. Thanks to the zeal of bishops and rectors, they go back to the fifteenth century. According to Dr. Jean-Noel Biraben, the population increased from 750,000 in 1497 (shortly after the Black Death) to 1,250,000 at the beginning of the sixteenth century and 1,740,000 in 1584. Calculated roughly, the annual growth rate from 1500 to 1584 was 4.66/ooo. More detailedly, periods with higher birth-rates alternated with "accidents" when the death-rate was high and there were fewer baptisms. Progress was not continuous, unswerving and smooth. Nevertheless, the balance

(Paris, 1971). Some improvements were added later but they make little difference to the conclusions that can be drawn. Figures are also to be found in J. Dupâquier: *Histoire de la population française, op. cit.*, volume II, p. 76.

[37] A. Bellettini, *La popolazione italiana in profile storico* (Turin, 1987); V. Perez Moreda and D. S. Reher, *op. cit.*. Differences in development can be seen in Germany (compare Pomerania and Westphalia) and in the United Provinces (compare Over-Ijssel and Holland), as well as within a single region: cf. note 45.

[38] The tithes of Onnaing and Quarouble have been published in M. Morineau, *Les faux-semblants d'un démarrage économique Agriculture et démographie en France au XVIIIe siècle*, (Paris, 1971). The few changes to be added do not change our interpretation.

was positive: life prevailed over death, and growth made game of the regrettable episodes of 1530 and 1565-1566. We can recognise a phase and style A which we have already met with in Languedoc (and in England). This time the data are more reliable than in Languedoc. Alain Croix, the first historian to study the population of Brittany, spent a lot of talent and energy distinguishing between crises due to lack of food, crises due to epidemics and crises due to a combination of these factors. Evaluation data are not so perfect in other regions, but there is no doubt that the population increased everywhere in the geographical area we know today as France (with the usual reservations and exceptions). The rise in population was interrupted everywhere, except in Alsace and Lorraine, in the last decades of the sixteenth century because of famines made worse by disease, and here and there because of the havoc of war (notably in the Low Countries.[39]

After this, population trends differed. Another spurt occurred everywhere after the end of the sixteenth century. Growth in Brittany and Languedoc was at the same slow rate of 3.3/ooo per year. In both provinces it lasted for the same length of time, almost eighty years. It was a revival of phase and style A: severe setbacks, such as the 1630 plague epidemic, had been surmounted. In the East, in the provinces that were still not part of France, Lorraine, Alsace and Franche-Comté, and indeed in Champagne, growth stopped suddenly about 1630, and a phase and style B began which were to last about 30 years. It would be out of place to regard this as a Malthusian punishment for over-population: the obvious reasons for it are the combined evils of famine, the plague and war (that raged at the same time in Germany) which, when given the opportunity, joined forces to make the situation even worse. The Parisian Basin's development lay between these two patterns. It has been masterfully illustrated by P. Goubert in his thesis on the Beauvais region in the seventeenth century.In some places there, about 1630 and a short while before, phase and style A gave way to a phase and style C. A deceptive succession of short

[39] Jean-Noel Biraben and Alain Blum, "La population de la Bretagne de 1500 à 1839" in *Populations et cultures. Etudes réunies en l'honneur de François Lebrun*, (Rennes, 1989), pp. 21-3; Alain Croix, *La Bretagne aux 16e et 17e siècles. La vie, la mort, la foi*, (Paris, 1981).

spurts in the birth-rate and a renewed increase in the death-rate which cancelled out almost immediately the spurts in the birth-rate gave rise to a long period of stagnation. We should not forget that this is the pattern that has recently been labelled as the pattern of *ancien régime* demography, although, as we have just seen, it did not apply to all French provinces [40].

We may wonder whether the last case examined, the Parisian Basin, was not an example of Malthus' theory. Recurrent futile attempts at growth might perhaps reveal the insuperable obstacle of a shortage of food. But let us take a closer look and compare the Parisian Basin with Brittany. For this purpose there are available two collections of maps showing population density about 1664, drawn more or less at the same time [41]. In the centre of the Parisian Basin, a region with rich lands and solid agricultural-labourers, population density varied between 28 and 56 inhabitants per square kilometre, and we have seen the slump in population there from at least 1630. The average population density in Brittany was about 50 inhabitants per square kilometre. However this figure included both Arcoat and Armor i.e. the physically harsh and sparsely-populated interior and the coastal area. In the coastal area (and in the Rennes Basin), population density rose in many places to about 100, and sometimes even up to 200 inhabitants per square kilometre. The contrast with the Parisian Basin is startling and it is impossible to account for it in Malthusian terms, stating that there were more food resources in Brittany and less in the Ile-de-France and its surrounding area. A more thorough study would take into account social and economic differences but the final outcome would be the same. To put forward Malthus' theory lacks credibility as much in the

[40] Regional studies in France are too numerous to be mentioned individually. We shall merely refer to them *en bloc*. This third part of the study has been developed in 1995 in an article entitled "*Subsistances et population*" (yet to be published).

[41] Maps in A. Croix, *op.cit.* pp. 126-127 and J. Dupaquier, *La population rurale du Bassin Parisien à l'époque de Louis XIV*, (Paris, 1979), p. 183. In this latter book, the number of households given (excluding Paris) varies from 6.4 to 12.6 per square kilometre, whch means approximately between 25-28 to 50-56 inhabitants per square kilometre. Only in Normandy did population densities recover, and mainly in the Armorica region where there was an isolated maximum of 19 households per square kilometre.

Parisian Basin in the eighteenth century as elsewhere[42].

Two causes can be attributed to phase and style C in the region where they have been noted (the Parisian Basin). The Parisian Basin was more vulnerable to climatic extremes, which were responsible for bad harvests, than Brittany was, because of the maritime influence on Brittany's climate: several times Brittany was spared a bad harvest and supplied food to provinces that had suffered disaster. Was this exaggerated climatic sensitivity in the Parisian Basin the reason for the food crises P. Goubert describes? It is not to be ruled out. The second cause could be that endemic centres of infection, not always the plague, persisted in the Parisian Basin, and that germs were more virulent when epidemics flared up. Of course, these causes may have combined at times, accounting more clearly for the extremely high death-rate of certain periods. We have already listed the modulations of these "accidents" both on a theoretical and a practical level (in sixteenth-century Brittany). They are actually self-evident. In accepting them, we can understand both phase and style A, during which force 1 or force 2 crises could have become more acute without preventing long-term growth, and phase and style C in the Parisian Basin with its more damaging force 4 or force 5 crises that made all attempts at recovery fall short [43].

Modulations allow us to account for post-1670 situations that would otherwise be difficult to understand. Wheat production did not change for about 25 years, but, despite this, the death-rate was

[42] The reasons for the difference were the partition of land into large and small lots, the adoption of buckwheat in Brittany (and in the Armorican region of Normandy). We ought to mention the thesis by Ester Boserup, *The Conditions of Agricultural Growth: the Economics of Agricultural Change under Population Pressure*, (London, 1965), even though we do not accept all her suggestions. There are some interesting facts about population behaviour in the cloth regions in Jean Tanguy, *Quand la toile va...*, (Rennes, 1994).

[43] Several scales have been proposed to measure how harmful mortality crises were. Cf. J. Dupaquier,"L'analyse statistique des crises de mortalité" in H. Charbonneau, ed.: *Les grandes mortalités, étude méthodologique des crises démographiques du passé* (Liège, 1979), pp. 83-112; F. Lebrun, 'Les crises démographiques en France aux XVIIe et XVIIIe siècles' in *Annales E. S. C.*, 1980, pp. 205-234 and, on Alsace, Jean Marie Boehler, *Une société rurale. La paysannerie de la Plaine d'Alsace 1648-1789* (Strasbourg, 1994), pp. 469 *et seq.*. Demographers agree that there were several causes responsible for triggering and maintaining the mortality crises. There is not such an agreement of opinion about their disappearance and the attenuation of food shortages. Cf. later in the text.

as high as before and affected provinces that until then had not had a high death-rate, such as Brittany and Languedoc. Some historians, following in E. Le Roy Ladurie's wake, have connected the demographic crisis with events such as the fall in prices, increased taxation, revolts and repressions. But these influences, which are not to be ignored, must be measured and given some thought. Low market-prices could have made land-owners and big farmers moan, but were welcomed by most French people who were glad to eat cheaply and consequently to improve their health. Taxation is an area that has not been examined sufficiently, and its bearing upon a population's welfare has been studied even less: taxation varied greatly from province to province, and the tax system had been complicated by the changes introduced by Colbert (most taxes were now raised by indirect taxation instead of by direct taxation as previously). There were not revolts and repressions everywhere, whereas the fall in the population was to be seen everywhere except in the outlying provinces where the population level was beginning to rise again[44]. Pathogenic agents were the most powerful vectors of the death-rate, but this time food shortages had not always prepared the terrain for them.

Food shortages returned with a vengeance in the last decade of the seventeenth century: several places, including Auvergne, were on the brink of serious famine. They accentuated the fall in population that was already under way. Recovery that followed was stopped by the bad harvest of 1708, the winter of 1709 and its after-effects which were felt in 1710 too. Sometimes population levels plummeted right down into the depths. There is no other way of describing the situation in the Massif Central where the birth-rate

[44] The period from 1664 to 1689 was badly understood by Boisguillebert who was the first to attribute responsibility for the fall in prices to Colbert's politics, and wrote in alarming tones about the downfall of farmers and landowners. This pessimistic interpretation was confirmed in the nineteenth century under the influence of the economists of the time. It shows how farmers with big or average-sized farms speculated on a future rise in prices and agreed to pay expensives leases that became too demanding. On the contrary, the low levels of market-prices meant that the masses enjoyed a period of affluence: they could buy food cheaply and had money to spare for other kinds of purchases. Cf. M. Morineau, *Pour une histoire économique vraie*, (Lille, 1985), and "Esquisse et crise: une relecture nécessaire d'Ernest Labrousse", in *Annales Historiques de la Révolution Française*, (1996, numbers 303 and 305).

index had risen to 130 in 1670 and was no more than 75 or 80 in 1720. It rose to just below 100 a few years later and stayed at this level until the end of the *ancien régime*. We have seen that in Languedoc, where losses had not been so great, stagnation lasted just as long. Brittany had borne the calamities of the seventeenth century valiantly, but did not recover in the eighteenth century. Like all the western part of Armorica, it was a victim of recurrent disease such as typhus and dysentery. These frequent epidemics and periods with a high death-rate probably contributed to giving the region a bad reputation when it was continuing to export grain and was no more responsible for its sickness and deaths than the Parisian Basin had been in earlier times. Here, after the Angel of Death passed through (phase B), there was a timid transition from a phase C to a phase A at a date which, by agreement, is often set at 1750, but which was not respected everywhere. It was a "restoration", a replica at a later date of the behaviour of those centuries before the Black Death and of the sixteenth century; a "restoration", but not yet a "demographic revolution". A growth of about 30%, after all, is nothing spectacular[45]

In contrast with this stunted growth, the northern and eastern provinces we have mentioned above had a flourishing demography. Alsace is an excellent example. The Thirty Years War with its accompanying ills had left Alsace not totally empty, but semi-deserted, since it had lost between half and two thirds of its population. Recovery and reconstruction began as soon as the war ended. It was aided by the return of the refugees and a large-scale immigration, notably of Swiss people. Alsace withstood the wars and epidemics of the end of the seventeenth century. The population continued to increase in the eighteenth century, and in 1789 Alsace

[45] J. N. Biraben and A. Blum, "La population de la Bretagne de 1500 à 1839" in *Populations et cultures. Etudes réunies en l'honneur de François Lebrun,* (Rennes, 1989). This does not exclude looking for specific causes. However prudence is advisable. Hygiene in Brittany was blamed in the eighteenth century, but why should it not have been equally responsible for disease in the sixteenth and seventeenth centuries? Even at relatively close distances, there have been great differences in population behaviour. In the *généralité* of Moulins, the small land of Les Amognes had a huge increase in population in the eighteenth century, whereas the Allier valley still stagnated in phase C. The end of the kingdom of Louis XIV has been studied in a masterly way by M. Lachiver, *Les anneés de misére* (Paris, 1991).

had 80 inhabitants per square kilometre, almost twofold the "national" average. A similar situation was to be found in Hainaut and Franche-Comté, and perhaps in Roussillon. The term "restoration" takes on an additional meaning there: losses were made up by a return to style and phase A, and, on occasion, a previous record was broken. As it galloped along, this demography obviously posed specific problems, but in the meantime it dismissed conjectures founded only on an artificial "national" average[46].

Have we not, in a roundabout way, come back to a commonplace of historical demography? The scale of the re-population of Alsace, the continuous growth (which carried on into the nineteenth century) seemed to bring to mind again, irresistibly for certain historians, the idea of a "demographic revolution", immediately connected with an "agricultural revolution". In the same vein, "masked crises" were discovered in other places, and they too were linked with changes in agriculture and began a "new" demographic régime. However, these "masked crises" could also be called minor crises, and in these terms would be like the crises seen in phase A of the sixteenth and seventeenth centuries, and those crises which, despite overall growth, probably left their mark on the eleventh, twelfth and thirteenth centuries. Any debate on the question in the eighteenth century should not be confined to production and the state of the markets. Trade improved and that could have contributed to the fall in market-prices. The idea of total autarky at a local level, of small, closed, self-sufficient environments, wholly inward-looking and having no contact with each other, was no longer advantageous, if it ever had been advantageous[47]. Trade was developed to various degrees: the people of Cantal took their cheeses to Aquitaine and came back

[46] For Alsace, cf. J. M. Boehler, *Une société rurale. La paysannerie de la plaine d'Alsace 1648-1789,* (Strasbourg, 1994); more generally, c.f. M. Morineau: *Les faux-semblants d'un démarrage économique. Agriculture et démographie en France au XVIIIe siècle,* (Paris, 1971). Conjectures about a line from Saint-Malo to Geneva that separated a well-developed France (in the north) from a backward France (in the south) are unfounded and anachronistic compared with the economic situation in the eighteenth century.

[47] Jean Meuvret discovered the "masked" crises in the eighteenth century. Cf. his *Etudes d'histoire économique,* (Paris, 1971). But he was willing to accept new, valid arguments and change his position.

with corn; the inhabitants of present-day Ardèche obtained corn from the Rhone valley, from Burgundy, and paid for it with their silk and their cattle; the inhabitants of Nice and the Genoese Riviera (to examine an area outside France) obtained corn in exchange for their olive oil. Goods were imported and exported from further afield: in Marseilles from the Maghreb and the East; in Bordeaux and Rouen from England as long as she was exporting, and from the Baltic countries. Nevertheless, it is possible that the wheat situation eased merely because of favourable climatic conditions, or because the types of wheat adapted to conditions at the same time as the biological environment improved: we shall come back to this[48]. There was no lack of innovations. They were useful to feed the growing population. They did not appear suddenly in the eighteenth century and they had a varying impact. At the same time, we should dispel the inappropriate intellectual inventions concerning an "agricultural revolution", understood as it was with reference to cereals, and an "immobile period of history".

In contradiction to this latter concept, buckwheat was grown in Brittany from the fifteenth century. There is no doubt that buckwheat, which was a plus for the inhabitants, contributed to sustaining growth until 1680. Yet buckwheat was not sufficient to thwart the mortality crises at the end of the sixteenth and seventeenth centuries, nor the long period of despair in the eighteenth century, although it was grown continuously and, we are told, the area in which it was grown was increased. Maize replaced millet in Haut-Languedoc and Gascony in the early seventeenth century. Maize was frequently cursed because it was accused of impoverishing the soil, but nevertheless it provided the peasants with a very appreciable supplementary resource. But not even maize defeated the horrors of famine and the periods of high death-rate. When there was a shortage of chestnuts and turnips, as well as of corn, in Limousin, poverty and destitution were at their height and had negative effects on life. Potatoes were an

[48] Marseilles is well-known as an importer of corn from the East and from North Africa. For the inhabitants of Cantals in Aquitaine, cf. M. Morineau, "L'Auvergne et l'Atlantique" in A. Poitrineau ed., *L'Elevage en moyenne montagne*, (Clermont-Ferrand, 1984).Prefects' reports during the Consulate and the Empire describe a similar situation that had practically not developed at all since the eighteenth century. Yet-to-be-published research on these reports will amply prove this.

essential aid in Lorraine in the eighteenth century, and yet were an indication of pauperisation for the inhabitants who were forced to eat them for want of something better. Hainaut was unwilling to accept the potato, and cereal production was increased by cultivating fallow land (the *épilliers*), but the need to import was confirmed at the beginning of the nineteenth century, and there was no doubt that it dated from several decades earlier. Even in Alsace, where it would be tempting to describe growth as "lively" in view of the many ventures and successes there, "an increase in production" had become "a necessity to take up the demographic challenge", but it "had difficulty in keeping up with the population boom" and so there was no "real growth"[49]. We must add a final touch to the picture. The eighteenth century ended badly. In the mid-eighteenth century, harvests had perhaps benefited from some respite. However from 1764 or 1768 to the end of the century, except for the interlude during the reign of Louis XVI which is generally and debatably known as the intercycle, harvests were on the whole mediocre, or else frankly bad. The gravity of the 1770 and 1795 fiascos should be examined carefully. Yet they did not lead to the exaggeratedly high death-rate seen on former occasions. This is further proof that food crises and epidemic crises were no longer closely linked. The most virulent bacteria had begun to beat a retreat; demographic restoration could begin a triumphant march which was never again forced to a halt and which would lead to the population explosion we witness today - this time a real revolution compared to the centuries before 1800[50].

4. Malthus in England in the Modern Era

The research done by the Cambridge Group for the History of Population and Social Structure in England under the leadership of E. A. Wrigley and R. S. Schofield deserves the adjective tremendous and the book which crowned the research colossal. As everyone

[49] J. M. Boehler, *Une société rurale, op. cit.*, pp. 961-962 and the conclusion, pp. 1973 *et seq.*

[50] Alfred Perrenoud was the great defender of this opinion. Cf. "Atténuation des crises et déclin de la mortalité" in *Annales de démographie historique* (1989), pp. 13-29. The connection between climate and sunshine and their possible influence on microbes and their vectors needs to be studied.

knows and as the title tells us, it is the rediscovery of some 300 years, ending in 1871. The material was taken from parish registers which Thomas Cromwell had ordered to be kept in 1538 and which were the only instrument for recording baptisms, marriages and burials up to 1837 (when an independent registry office was founded). The information has been compiled after being collected by local researchers nation-wide. This information has been processed using a retrospective method called aggregative back projection. It was based on a statistical fact: if a society's size and structure were known, together with its birth-rate and death-rate, it was possible to determine in advance the number of births and deaths over a future period. E. A. Wrigley and R. S. Schofield have, as it were, turned the hour-glass upside down. Having gone through the registers and collected the numbers of births and deaths (amended to rectify certain deficiencies inherent in modern-era England), they considered that they were able to go on to estimate the population every five years, backwards from 1871 to 1541: an elegant procedure, which is scholarly, scientific and mathematical and consequently well-equipped to make a favourable impression[51].

This research has won universal admiration because of its sheer scale, but not all historians agree about the raw material, the method adopted and the results and ensuing comments. They have been amazed at the huge discrepancy between the basic facts and the greatly elaborated results that emerged from them. Historians were not happy about how representative the data were, because they became fewer the further away from 1871 they went: 540 parishes were analysed in 1871, but only 404 between 1837 and 1660, and the number dwindled gradually to 45 in 1541 when the reconstruction began. The authors hesitated politely when considering, for example, infant mortality or the population's resistance to crises. Ronald D. Lee revealed some faults in the aggregative back projection and suggested replacing it with an inverse projection capable of filling the gaps he had seen. Jim Oeppen went further

[51] E. A. Wrigley and R. S. Schofield found shortcomings in the records: there were no records of religious dissidents, emigrants, etc.

and pleaded for a generalised inverse projection. However it was thought that the changes suggested by these two authors could improve results but were basically in the same vein as R. S. Schofield and E. A. Wrigley's reconstruction. Noel Bonneuil, on the other hand, was very cutting and categorical. The method that transposed into the past the notions and parameters of the starting point - 1871 - was a polluting method. To quote Bonneuil: "When we go back in time, there is no reason why the solution provided by algorithm, e.g. for England from 1871 to 1541, should correspond to the historic reality it claims to recount". And again: "Methodologically, we have seen the failure of the method used by E. A. Wrigley and R. S. Schofield to reconstruct the population of the past in England. We have shown that with this method it was possible to obtain any solution whatsoever". [52]

These are technical opinions and harsh judgements that we will not accept point-blank: we need to hear the defence. But we shall make some observations of our own, starting with how representative the chosen parishes were. They represent 4% of the whole of England: 404 out of 10,000 parishes. This proportion is acceptable enough for an analysis. We would have liked to be told what percentage of the total population the population under study was, at a given date or on several dates (it could have changed) and what percentage of a county's population the population of a given locality was. We regret the lack of percentages all the more in that the unequal distribution of the sample villages favours the south and centre of England and penalises the west and the north, even though they were more

[52] Technical criticisms by Ronald D. Lee in "Inverse projection and retroprojection. A critical appraisal and comparation. Results for England 1539-1871" in *Population Studies*, (1986), and Jim Oeppen: "Back-projection and inverse projection: members of a wider class of constrained projection models" in *Population Studies*, (1991). Basic criticisms by M. W. Flinn: "The Population History of England 1541-1871" in *Economic History Review*, (1982); by L. Henry and D. Blanchet. "La population de l'Angleterre de 1541 à 1871", in *Population*, (1983), pp. 781-826; by Noël Bonneuil:"Non-identificabilité et cohérance démographique de la rétro-projection" in A. Blum *et al.*, *Modèles de la démographie historique*, (Paris, 1992) pp. 99-107.

dynamic at the end. E. A. Wrigley and R. S. Schofield have, moreover, sacrificed regionalisation, burying themselves in a "national" vista. This was as tendentious or perverse in England as it was in France. In the eighteenth century, growth was close on 80% or 100% in many counties (Staffordshire and Warwickshire) and was at more than 150% in Lancashire (the coefficient of Valenciennes); growth trailed behind in Bedfordshire (less than 25%), in Lincolnshire (20%) and in Norfolk (less than 15%), a situation similar to that in Languedoc. The overall situation does not seem very different on either side of the Channel. Reconstruction from these data deletes a crucial phenomenon of that era: the change in population density on either side of a line between the Severn estuary and the Wash, a movement due to industrialisation. The new face of England was the one it showed in the nineteenth century, and the algorithm can merely reflect this. This instrument of analysis and reconstruction had been used just the same for the Old England of the sixteenth and seventeenth centuries that had now disappeared. This point of similarity is fodder for Noel Bonneuil's condemnation. For want of alternative and detailed figures, we shall make do with the figures of R. S. Schofield and E. A. Wrigley at the first estimate, keeping them for our own use or recalling them like the similar "mutes" that accompanied the examination of the French situation [53].

According to Wrigley and Schofield, the population of England tripled between 1541 and 1801, going from 2,773,851 to 8,664,490 inhabitants (multiplication coefficient of 3.12). Growth in England appeared epic, undeniably more striking than in France, Italy and Germany where population growth over the same period did no better than double. Was the English rate unique in Europe? It is not

[53] P. Deane and W. A. Cole, *British Economic Growth 1688-1939: Trends and Structures*, (Cambridge, 1967), p. 103. It is possible that the population figures for each county need to be corrected, as E. A. Wrigley and R. S. Schofield suggest in a note, but the movements would not be sufficiently affected by these corrections to be contradicted. The shifting of the centre of gravity of English population is one of the most spectacular and well-known facts. Because of differences in dates among the authors mentioned, comparisons concerning the decade 1791-1800 are rather fuzzy.

certain. If we accept J. Oeppen's suggested figure (3.02 million in 1541), the multiplication coefficient drops to 2.86. The English rate thus resembles the Belgian rate (a coefficient of 2.6 between 1500 and 1800, all the more remarkable in that the former Spanish part had been bled by revolts and wars) and the Portuguese rate (coefficient of 2.67 between 1530 and 1800, again according to reliable censuses). The English rate of population growth is a long way behind the Irish one with a coefficient of 6.56! Of course we can not guarantee the accuracy of figures each time, especially in the case of Ireland. However, on the whole this classification stands a good chance of reflecting reality [54].

The situation seems to have evolved as follows. There was a strong and fairly regular growth in the sixteenth century, with only one slump, between 1558 and 1561. Growth continued in the first half of the seventeenth century at a slightly slower rate. A peak of 5.3 million was reached in 1656, followed by a fall which lasted until 1681. The next rise was slow and with many fits and starts so that the previous peak was not reached until 1736. From this date onwards, recovery was increasingly healthy: the annual growth rate jumped from 4/ooo and 5/ooo to 7/ooo and 8/ooo, and then to 11/ooo and 12/ooo in 1791. We now come to Malthus' era. The 1801 census, whose results (corrected by E. A. Wrigley and R. S. Schofield) we have reported, took place three years after the publication of the first edition of the *Principle of Population* and two years before the second edition. The population continued to grow in the first half of the nineteenth century.

The trend we have traced is not totally foreign to us. Let us remember something of what we found in France. The sixteenth century had been propitious to population growth in many regions. We have noted it, at least until a fairly late date, in Languedoc and Brittany: we would find other examples in Flanders, in Portugal and in Germany. In England, as in all of Western Europe, in the sixteenth

[54] C. MacEverdy and R. Jones, *Atlas of World Population History* (London, 1978). For Portugal, Jose Vicente Serrão, " População e rede urbana nos seculos XVI-XVIII" in Cesar Oliveira (dir.), *Historia dos Municipos e do Poder Local*, (Lisbon, 1996), pp. 63-77.

century a phase and style A reappeared: they had disappeared during the Black Death and the sluggish fifteenth century. Similarities in pace do not exclude variants. For example, the annual growth rate in England, 8/ooo, would have been higher than the rate in Brittany (5/ooo), not higher than that in Portugal. England was only slightly affected by the crisis at the end of the century that was so serious in Old Castile, in some French provinces and in the southern Netherlands. However the continent as a whole had not been affected and we have seen that growth had started again less briskly in Brittany and Languedoc (this time as in England), whereas growth languished in the Parisian Basin. However phase A ended at different times: in England it ended in 1656, earlier than in Languedoc and Brittany where it continued until 1670 or 1680. English recovery was, we have said, timid. It was, in two different ways, in strange contrast with the behaviour that could be observed in other countries. English recovery was better than in many parts of France that had sank in stagnation, but worse than in Alsace and Lorraine, and in Portugal and Catalonia that had been cruelly decimated by other Spanish provinces. After 1736, the growth rate in England readjusted. It outstripped France taken as a whole because of the disparities there (Alsace, Lorraine etc. continued to call the tune). But English population growth was not the highest in Europe in the eighteenth century: the highest growth rates were to be seen yet again in Catalonia, the future Belgium, the Scandinavian countries and, as one would have guessed, in Ireland, without forgetting Hungary and Russia that were in the full swing of recovery and expansion[55].

In putting England back among the European nations for research purposes, we have merely submitted to plain evidence. If English demography is studied on its own, research is *ipso facto* blinkered, and almost inevitably leads to a dogged quest for an almost innate or, at worst, acquired superiority that would apparently justify in the past other real or imagined preemi-

[55] Cf. the works mentioned in the previous note, and M. Reinhard *et al.*: *Histoire de la population mondiale*, (Paris, 3rd edition, 1968) and the figures collected by E. A. Wrigley, *Société et population*, (Paris, 1969), p. 153.

nences that we must discuss later. Comparisons should not be limited to France, especially if France is reduced to a single "national" entity or regarded from the deceptive angle of so-called *ancien régime* demography (E. A. Wrigley and R. S. Schofield did not have other reagents available when they wrote their book). If we widen the field of observation to the whole continent, we obtain other data-points, and here and there in Europe we find similar situations to those in England. Of course they need to be interpreted, but should not be ignored. The height and breadth reached in our research enable us to recognise what has been general and what has been particular, and to distinguish between what is common and what is original. Common territory is represented by the succession of phases and styles we have described (A, B and C, up to and including the "restoration" of growth). This succession took place at more or less the same time in every country: phase A in the eleventh, twelfth and thirteenth centuries, then again in the sixteenth century and lastly in the eighteenth century. It entailed variants and time-lags, but that is hardly surprising for the whole of Europe after what we have seen in France alone.

Differences arise because facts have different effects in different places. According to E. A. Wrigley and R. S. Schofield, England had an ordinary death-rate that was lower than that of other countries, including France, but not lower than that of every country in every age: see Portugal and Catalonia. In this perspective, we could say, using Malthus' terminology, that these positive brakes were badly applied. Other brakes of the same type failed to appear after the Black Death. There was nothing in England that bears comparison with the dreadful plagues in the Mediterranean at the end of the sixteenth or seventeenth centuries, and nothing that came anywhere near the destruction of the population in the Empire during the Thirty Years War. The consequent continuity of development - beyond what was in the end a fairly modest disturbance between 1656 and 1737 - certainly constituted an important and almost specific factor in English growth - with

reservations about its uniqueness in view of developments in the north-west of the Iberian peninsula. On the other hand, the prerogative of the industrial variable is often attributed to England, and certain historians consider it the great lever for the beginning of the rise in population in the eighteenth century, but there is much more uncertainty about this. First of all, the absence of industry, even in the old form of craftmanship, in scattered, rural areas did not prevent strong growth in several cases. Secondly, this type of cottage-industry was not confined to England: recent research reveals that it mushroomed in several French regions and this time, according to the locality, it both failed and succeeded in promoting population growth. Its presence therefore has a problematic significance and each case must be examined individually. This stands in the way of an automatic, blind generalisation. We must also remember that "big industry" or "large-scale industrialisation" often brought a *coup de grâce* to this old form of cottage industry, which did not start a sustained growth and consequently hardly solicits the unfortunate label "protoindustrialisation". The "Industrial Revolution" or "large-scale industrialisation" is badly dated and like the previous "industrialisation" for a long time did not exist in countries where nevertheless the population was growing. The "Industrial Revolution" refers to vast changes and the overthrow of the economic and social equilibrium that take us far from Malthus. This clarification clears the deck for us to return to E. A. Wrigley and R. S. Schofield[56].

[56] E. A. Wrigley in *Société et population,* (Paris, 1969) dated the "demographic revolution" before the "industrial revolution". One wishes that specific research had been done on Lancashire and the Midlands, whatever the conclusions that could have been drawn from it. It must be noted that many authors who have used Wrigley and Schofield's figures have not been very convinced about their chronology. England being the first country to take off industrially in Europe partly explains why researchers looked for her primacy in other fields. But we must be wary of going beyond the limits, which was facilitated by the still very widespread view of a demographic "*ancien régime*" which was supposed to exist everywhere in France. R. M. Smith had however noted that roughly between 1665 and 1690 comparisons disputed the validity of England's "glorious isolation". Cf. his paper: "Influences exogènes et endogènes sur le "frein préventif" en Angleterre" in A. Blum: *Modèles de la démographie historique,* (Paris, 1992), pp. 175-191.

We shall now move on from the strict analysis of the population graph to its interpretation and to comments on it. For their opening move, E. A. Wrigley and R. S. Schofield laid a Malthusian card on the table. Price fluctuations reflected and had reflected demographic pressure. As the number of people to be fed increased, there was not sufficient food for everyone and so people fought over it by outbidding one another. Malthus had described this process clearly: "An increase in population without a proportional increase in food will evidently have the sure effect of downing the value of each man's patent. The food must necessarily be distributed in smaller quantities and consequently, a day's labour will purchase a smaller quantity of provision..." A logical corollary, supported by an observation made in Sweden had led him to condemn the Poor. Soaring prices drove the poor out of the markets. Aid given to them brought them back into the markets. The number of potential buyers increased for provisions that had not increased. New competition had started, and the presumable result was that prices would rise again.

Wrigley and Schofield have perhaps not accepted all the tortuous reasonings of the evidence and the verdict. But they agreed with the main enumeration of the facts. They admired "the attempt to seize the connection between production and reproduction" and they made this idea the fulcrum of their reconstruction of population in England. At the same time, like Postan, they rendered homage to Malthus' perspicacity and they secured respectability and authority for their work. But Malthus' argument regarding prices was rudimentary and, in a word, gyratory: the conclusions were contained in the premises. They should have verified their soundness before using them, which, it seems to us, they did not[57].

[57] Malthus, *Essay on the Principle of Population,* (1798), page 82. The Swedish example was introduced for the first time in *An Investigation of the Cause of the Present High Prices of Provisions,* (1800). The allusion to Gregory King's law of corn-prices belonged to tradition. But when there was a succession of shortages, years after year, prices rose so steeply in the first year that there were only a few potential buyers left who were willing to pay as much and generally able to "hold out" without making prices rise further. Hence the appearance of a plateau in price rises.

The history of prices has had a checkered career. It has been tossed about between a quantitativist theory that smacked of bullionism and a populationist theory. The two options had in common that they were based on a *petitio principii*: the fact that bad harvests were transient and rapidly cancelled out. What was important for analysts of both schools of thought was the long-term trend, and that was dictated by allegedly profounder forces at work: monetary resources and the size of the population. The wheat situation had merely provided a neutral background for the fluctuations of market-prices. A mere glance at corn-price trends ought to have been sufficient for us to understand how wrong it was. Corn-price graphs are arranged in a succession of sequences connected with the years of cereal shortage. An impulse determines a rise and a return to a calmer situation determines a fall. But the two movements are not necessarily equally balanced, and in reality are hardly ever so. The trend is merely their consequence. When crises occur in rapid succession, sequences interlock and there is an upward trend. There has to be a series of good harvests for prices to fall and *a fortiori* for them to remain low for some time.

It is amazing that many English historians refused to confirm this situation when some excellent research by Tooke, Newmarch and W. G. Hoskins, and equally excellent research into the effects of climate and meteorology by Jevons and Beveridge were available to them[58]. The periods of growth in the sixteenth and seventeenth centuries we're above all the reflection of the repeated jolts in production. And, of course, the prices against which Malthus railed were high because of the exceptional shortage of food, and not because of the greed of the poor, supported by the damaging results of the Poor Law. The periods of decline or low prices (roughly speaking at the beginning of the seventeenth century, between 1660 and 1690, and between

[58] W. G. Hoskins: "Harvest Fluctuations and English Economic History 1620-1759" in *Agricultural History Review* (1968); T. Tooke and R. Newmarch, *A History of Prices in England*, (London, 1839-1857); W. S. Jevons, *The Solar Period and the Price of Corn*, (1875). In publishing *Prices and Wages in England from the Twelfth to the Nineteenth Century*, (New York, 1939), W. Beveridge sought to identify the climatic variations which he believed could be seen from the trends.

1720 and 1740) are accounted for by a re-ordering or by a particularly favourable sequence. Strangely or irrationally, periods of growth are often described as dynamic and periods of decline as depressing. It is a way of judging them that is due to a more or less unconscious intellectual reflex connected with class[59]. When bread was expensive, the lower classes suffered and tightened their belts; when corn sold badly, farmers who had signed exorbitant leases found themselves in difficulty, like the landowners who could no longer collect their rents. Good fortune for some, ill fortune for others: a situation with low prices seemed to benefit the lower classes (provided epidemics did not interfere). As we shall see, the relationship between the two sets of facts is more complex (we have glimpsed something of this in France). On the whole, price graphs in England show more or less the same pattern as those in other European countries, with some rearrangements that correspond to the relative changes in tension. This note is to be filed with the preceding ones in the file on the comparative school[60].

Set out in Malthus' terms, the populationist theory regarding the rise in prices harbours another surreptitious affirmation or a misunderstanding. It takes us to the point when the equilibrium between food resources and population broke down. Malthus admitted that there were some reserve supplies, although they were limited[61]. E. A. Wrigley and R. S. Schofield followed his reasoning up

[59] This reaction of Malthus' is seen in his accusing the poor of being improvident, lazy and of spending their money, when they had any, at the pub. The word "class" has no Marxist connotations here, but is used merely to identify and distinguish population groups.

[60] These periods of low prices may have been interrupted by bad periods as in Languedoc and in Scotland. Cf. A. J. S. Gibson and T. C. Smout, *Prices. Food and Wages in Scotland 1550-1780*, (Cambridge, 1995). The difficulties of the last decade of the seventeenth century did not prevent French Hainaut, Alsace etc. from recovering, albeit at a slower rate. Cases of population growth in unfavourable conditions are even more striking in Portugal (cf. J. V. Serrâo, "Populaçâo e rede urbana nos seculos XVI-XVIII" in Cesar Oliveira (dir.), *Historia dos municipos e do poder local*, (Lisbon, 1996)) and in Catalonia (cf. J. Nadal Oller in V. Perez Moreda and D. S. Reher (eds.), *Demografia historica en España*, (Madrid, 1989).

[61] Malthus, *Essay on the Principle of Population*, (1803). He quotes from Wargentin the example of Sweden whose population had increased between 1751 and 1799 without there having been any need to increase corn importation.

to a point[62]. The most zealous disciples rather ingenuously believed that the population was repeatedly on the verge of absolute famine, and that every rise in price reflected an increase in population pressure. Most English historians have rightly refused to ascribe the rise in prices in fifteenth century England to an American cause. Nor is it relevant to involve the populationist theory in accounting for this price-rise. The fact that growth had begun again recently, together with the great possibilities of extending the cultivated area and so increasing production, excluded the risk of society being on the brink of structural exhaustion, as Malthus' theory predicted. We have already met with this situation in Languedoc and, as there, in England too, bad harvests accounted for rising prices. It will be objected that, although the Malthusian mechanism may not have been in place in 1500 or 1541, it could well have been in place at the end of the sixteenth century. Mixing the data (size of the population, wages, prices) together would produce a superficial argument, involving a great deal of conjecture[63]. But once again, as on the continent, we must blame the high wheat prices which for a long time were not met by a similar rise in wages and other remunerations[64]. We shall not dwell on the connection between harvests and prices that we have already discussed: this connection may be seen in England both in periods of high prices and in periods of low prices in the seventeenth and eighteenth centuries with, in the eighteenth century, a serious lag in wages that, with all due respect, renders Malthus' condemnation of the poor and the Poor Law grotesque[65].

[62] E. A. Wrigley and R. S. Schofield in *The Population History of England 1541-1871. A Reconstruction,* (London, 1981) consider that an annual growth of 5/ooo was sustainable but that the rate of 8/ooo was beyond the warning level.

[63] Using the figures provided by E. H. Phelps Brown and Sheila V. Hopkins in "Seven centuries of Building Wages" in *Economica* (1955), it would be possible if decades were chosen *ad hoc* to make the multiplication of the number of inhabitants by an artisan's wage coincide with later decades. But this would only be valid in southern England, and over time the figures would not be equal.

[64] Salaries did not catch up until the last decade of the eighteenth century in southern England. It is again to be regretted that we do not have data which would have been useful for Lancashire where salaries had increased notably.

[65] Pitt the Younger had proposed giving one shilling per week to poor journeymen for each child after the third one. Malthus absolved Pitt magnanimously : "I entirely

E. A. Wrigley and R. S. Schofield have not questioned this proposal of Malthus, which nevertheless would have been worth questioning. The criterion they used to analyse demographic evolution, real wages, rendered this questioning almost compulsory. They believed that real wages constitute the most reliable indication of English population trends. The increase in population led to dwindling wages until about 1656. Wages then rose and, after a certain length of time, were responsible for the start of population growth in the eighteenth century: higher wages encouraged marriage at an earlier age. The Malthusian trap was thwarted at the same time. Presented in these terms, the argument gives rise to some misgivings. Obviously the authors had the "demographic revolution" of the eighteenth century as their objective. They paid less attention to the sixteenth century which appears mainly as a foil. There have been many reservations about the length of a time-lag between the improvement of real wages and the growth it was supposed to prompt. Wrigley and Schofield parried this with two socio-psychological aspects: the normal delay in people becoming conscious of phenomena, and the haphazard passing on of the good news from one generation to another, from grandfathers and fathers to children. Is it totally convincing? Let us add that real wages fell in eighteenth-century England, and that the disappearance of the Malthusian trap, and the continuation, indeed the intensifying, of growth pose a problem. Is there not another weakness in the argument?

The real wages index has been taken from the relatively old study by E. H. Phelps Brown and Sheila V. Hopkins. However these two authors had refrained from submitting a measure for it. The most appropriate term, taken up again by B. R. Mitchell and Phyllis Deane is the cost-of-living index[66]. The distinction is not byzantine. The

acquit Mr. Pitt of any sinister intention..." (*Essay on the Principle of Population*, (1798), p. 134). He later continued to rail against aid given to the poor in the parishes.

[66] "So we have not tried to construct any measure of real wages in the modern sense" in "Seven centuries of the prices of consumable compared with builders' wage-rates" (*Economica*, 1956, p. 296). B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics*, (Cambridge, 1971), pp. 346 *et seq.*

method of elaboration accounts for it. Phelps Brown and Hopkins had taken the expenditure of William Savernak of Bridport in Dorset as the matrix of their calculations, referring to the maintenance of two priests and their servant about 1450. From this they had deduced the percentages ascribable to every kind of food, to heating and candles, and to fabrics. The budget made up in this way was then transplanted in time down to 1950, with some slight alterations to take into account, at least in theory, the changes in consumption habits. The original proportions were kept throughout: 20% spent on cereals, 25% on meat and fish, 12.5% on fats (butter, cheese), 22.5% on beverages (beer and tea when it became commonplace) and their ingredients (malt, hops, sugar), without mentioning other items[67]. This model was then compared with the average wages of an artisan or a foreman in the building trade. It was ingenious but artificial.

Let us imagine that we have entered a period of high prices. What would have happened? If the repartition of the items in the budget had been retained and if every product had been affected by the rise in prices, a person would have had to buy less of each product, running the risk of obtaining only a very small quantity of some products, a paltry fare which would not have provided for his physiological needs. This would have been absurd behaviour. In similar circumstances, a person would probably have re-apportioned his expenditure to meet the minimum requirements for staying alive, buying the most nutritious foods and sacrificing the other foods. If the rise in prices had been unevenly distributed and had affected mainly, if not only, bread or oats (which was still grown in some places in England), reaction would have been similar: the food that was considered most essential would have been preferred to other food that was bought together with it in less hard times. In any case, the fixed percentages seem illusory, and

[67] William Savernak's accounts in K. L. Wood-Legh, *A Small Household of the Fifteenth Century*, (Manchester, 1956).

[68] The cost of living in relation to the price of corn has been studied by E. Scholliers, *Loonarbeid en Honger. De Leven standaard in de XVe en XVIe eeuw te Antwerpen*, (Antwerp, 1960); R. Gascon, *Grand commerce et vie urbaine à Lyon au XVIe Siècle*, (Paris, 1971); Jan De Vries... etc.

real wages in reality differed from the cost of living as calculated by Phelps Brown and Hopkins, sometimes by a great deal. In these conditions, there are evident doubts about using the cost of living as a substitute or as a rule in population analysis. At a pinch, the index of the price of wheat and oats would have been more acceptable[68]. Let us add that the wages considered apply to southern England and not to the whole of the country, and are closely dependent on the figures assembled by Elisabeth W. Gilboy in 1934[69].

In any case, there is no explanation: we fall back on the succession of good and bad harvests, and we detect no better why growth began in the second third of the eighteenth century, despite the insinuated time-lags. To identify a general line of argument, we must make a preliminary wager on the relevance of Malthus' theory, adding the conviction that there was a way out of the eighteenth century tunnel. This is tantamount to ignoring the context. It is true that another idea backs up Wrigley's and Schofield's reasoning: the idea that England had forged ahead compared with the continent - especially compared with France - as far as the economy and, more precisely, agriculture were concerned. England seemed to have freed itself from the trap of subsistance crises a lot sooner than France. The game appeared to have been won - according to A. B. Appleby's research - as long ago as the second half of the seventeenth century, and English corn yields were double French yields at the beginning of the nineteenth century[70]. The line of attack is no longer quite Malthus': from now on, his retrospective predictions would have value only further back in the past. It would provide proof of the "trap" that preceded the "industrial revolution, without prejudice having prepared it[71]. It would not put

[69] E. W. Gilboy, "The Cost of Living and Real Wages in the Eighteenth Century" in *Review of Economic Statistics*, (1936), taking up her thesis, *Wages in England in the Eighteenth Century*, (1934).

[70] A. B. Appleby, "Grain Prices and Subsistance Crises in England and France" in *Journal of Economic History*, (1979), pp. 865-887.

[71] If they were to suppose that Appleby were right, Wrigley and Schofield would have had only the application of Malthus' hypothesis to go by: M. W. Flinn had already drawn attention to this. Unless they adopted Postan's explanation of the early fourteenth century...

"real wages" - or what took their place - back into the saddle again. But the economy-demography synergy could provide the reason for the superiority and ascendancy over France from before 1798 which was to last until 1914 or later.

Are these new props for reconstruction more solid than the previous ones? Appleby had discovered that cereal price-curves behaved differently in England from how they behaved in France. He had compared the curves of Pontoise for France with those of Norwich and Reading for England between 1680 and 1744. On the Pontoise market, an outbreak of high prices for wheat had immediate repercussions on secondary cereals. Appleby considered this an indication that there was a fundamental insufficiency of cereal cultivation. In England, on the other hand, in similar circumstances, barley and oats were not affected: their prices did not rise. This proved that English agriculture was in a position to ensure corn supplies. The deductions are not totally convincing: they would be more convincing if we were sure of the constancy of the phenomenon everywhere and in every period. It was nothing of the sort. The market at Amiens in France on several occasions developed like the markets at Norwich or Reading, whereas the London market developed like the French market at the end of the eighteenth century[72]. And so, if we increase the range of observations, we attribute the conclusions, drawn from limited examples, and their extrapolation to more fundamental causes, such as England's having acquired agricultural superiority at a certain moment[73].

[72] Amiens market-prices in the Town Archives, Series HH (published in part by F. and P. Desportes and P. Salvadori with the title *Mercuriales d'Amiens at de Picardie* - Amiens, 1990). London prices in F. Morton Eden, *The State of the Poor* (1797), volume III. For Exeter, W. Beveridge: *Prices and Wages in England from the Twelfth to the Nineteenth Century,* (New York, 1939).

[73] From this we cannot deduce that English and French markets were exactly the same. There were slight differences in climate on each side of the Channel and always meteorological hazards that immediately affected the results of the harvests. These facts go against the argument that the two countries were alike: they are at the basis of Jean Yves Grenier's deception: *L'Economie d'Ancien Régime,* (Paris, 1996), pp. 269-285. We should not forget that barley was used exclusively to brew beer in England, whereas in France brewing was on a much smaller scale.

Wrigley and Schofield have used a deceptive base to measure the difference in yields, although this same base was tenaciously used again. It is a mistake of the "national" type. England and France are compared without taking into account the difference in their surface area (which goes up to four times as much!), or the fact that France's territory includes all the most unproductive soil e.g. the mountains. If we take an area in north-west France of the same size as an area in England, and comparable in the quality of the soil, the difference diminishes and becomes almost non-existent[74].

5. Revolution, how many crimes are committed in your name?

B. M. S. Campbell's and Mark Overton's recently published research would, in theory, be more suitable for providing the desired corroboration. Their ambitious undertaking aimed to reconstruct English agricultural production, mainly vegetable production, from 1300 to 1871. Could a better counterpoint be imagined to Wrigley and Schofield's population reconstruction? The book is full of information: the area that it was possible to cultivate, the area that was actually cultivated, information about crops, including the species of crops, percentages, yields for each species and so on. The lists are repeated seven times to cover each of the seven centuries of agricultural development[75]. There is so much detail that it raises fundamental questions about the origin and the credibility of the basic facts. Inventories drawn up on a person's death were used in research. Generally they do not give direct information. For

[74] The changes necessary for a just comparison have been described by M. Morineau in *Les Faux-semblants d'un démarrage économique. Agriculture et démographie en France au XVIIIe siècle*, (Paris, 1971), p. 82. The work has been taken up and developed several times.

[75] M. Overton, *Agricultural Revolution in England. The Transformation of the Agrarian Economy 1500-1850*, (Cambridge, 1996). See also the article written jointly with B. M. S. Campbell, "Production and productivité dans l'agriculture anglaise 1086-1871" in *Histoire et Mesure*, (1996), volume XI, pp. 255-297. In this article the dates used as landmarks appear most crudely: 1086, 1300, 1380, 1520, 1600, 1700, 1800, 1830 and 1871.

example, the researchers had to extract the figures concerning yields from declarations in terms of the quantities sown compared with estimates in terms of the quantities harvested (but not always with the same coefficient), without any guarantee that the filters used had not distorted reality[76]. The representativeness of the lands investigated, the size of the area cultivated and its productivity had to be extrapolated in time and space: however, inventories had been drawn up in various ways, with regard to both form and subject-matter, which led R. C. Allen to challenge them in sixteenth-century Oxfordshire[77]. It is thought that Campbell and Overton asked the appropriate questions on their own account. And so we will not dwell on this point, even though the answers do not necessarily seem obvious. Neither will we underline the risk of falsification that stems from the restricted number of counties examined (11 or 12 out of 43) and above all because of their being concentrated in South-East England[78]. As we have done previously, we will take the results shown as they stand, trying only to assess their relevance, their significance and their importance.

However there are still some critical observations that we must

[76] Inventories drawn up after a death do not state corn yields directly. They do not even state a simple result obtained by dividing the quantity of cereals harvested by the area harvested. There has to be a very fine balancing between the quantities sown and the quantities harvested on surfaces which are not the same, using as a basis "certain suppositions about the methods of evaluation adopted by those who drew up the inventories" wrote B. M. S. Campbell and M. Overton, *art. cit.*, pp. 262-263. The assumption that there was a consistency in the recording methods was challenged by Robert C. Allen in *Enclosure and the Yeoman: the Agricultural Development of the South Midlands*, (Oxford, 1992). Lastly, evaluations are expressed in monetary units in the documents. Hence an additional problem of conversion and the inherent risks of distortion. The formula used is to be found in M. Overton, *Agricultural Revolution in England. The Transformation of the Agrarian Economy 1500-1850*, (Cambridge, 1996), p. 20.

[77] R. C. Allen eliminated systematically the figures taken from inventories after death in the sixteenth century because the quantities given referred solely to seeds. Cf. G. Clark, "Yields per acre in English agriculture 1250-1860: evidence for labour inputs" in *Economic History Review*, (1991), pp. 445-460.

[78] Norfolk, Bedfordshire, Berkshire, Buckinghamshire, Essex, Hertfordshire, Kent, Middlesex, Northamptonshire, Oxfordshire, Surrey and part of Worcestershire. Yorkshire is counted as three counties: the North Riding, the East Riding and the West Riding.

make. Presenting one century after another suggests a continuous development, a triumphal march without any hitches that would thus confirm the demographic trend outlined by Wrigley and Schofield. But it is debatable whether actual progress was so straightforward [79]. The process eliminates the intervening fluctuations whose existence has been established beyond doubt in other countries and can not be denied *a priori* in England [80]. The fault in the construction can be seen almost immediately. We jump in one fell swoop from 1380 to 1600, with no point of reference even for 1520. Consequently we have no pattern available for the sixteenth century: this is unfortunate and prevents the slightest attempt to verify Malthus' theory. All the same, the amount of food resources *per capita* at the end of the sixteenth century, 4 hectolitres of corn, was still enough to ensure decent, though "spartan", nourishment. In fact, here we have again the false dilemma we saw in Languedoc: pauperisation was not impossible (and it would eventually and probably have a social connotation); however in a normal year a total exhaustion had not yet been reached [81]. The negative distortions induced by the sequences of bad harvests between 1590 and 1599 and between 1690 and 1699 are indicated, but the good harvests are not, so that we may wonder whether the better yields theoretically recorded in the seventeenth and the first half of the eighteenth centuries were due to improved methods of farming or merely to favourable climatic conditions (which we know existed at the same time in France). Lastly, the rise in yields from 16 to 22 bushels per acre between 1750 and 1800 clashes with what we know about climatic conditions. Lean

[79] M. Overton, *op. cit.*, in the third chapter, *Agricultural output and productivity*, uses the data produced by E. A. Wrigley and R. S. Schofield. Here they must be verified. "Post hoc, ergo propter hoc..." Even if we dare not suspect it, the idea must spring to mind...

[80] Fluctuations in different periods are visible in the curves of Quarouble and Onnaing, already quoted. Cf. M. Morineau, *Les Faux-semblants...op. cit.*. They can also be seen in the curves of regional yields in France after 1815 (discussion should not be limited to "national" yields).

[81] Is this hiatus for the sixteenth century the echo of R. C. Allen's remarks? Cf. Notes 76 and 77. For *per capita* figures relating to food supply, we will refer to the table used here, in which only cereals have been taken into account.

cattle took the place of fat cattle from 1764 and became frankly skin and bone in the last years of the century which coincided with Malthus' appearance on the scene. The likelihood here is, as G. R. Fussell suggested, at best, an increase from 20 to 22 bushels per acre in the eighteenth century. Yet we found in the book by Campbell and Overton, perhaps inadvertently on their part, material for controversy concerning this last statistic[82].

In short, Campbell and Overton have repeated in agriculture Schofield and Wrigley's omission in demography. They have "forgotten" the weather factor. In this, they were influenced by a tradition of being convinced about England's progressionism and eager to keep tally of its symptoms. But the tendency to mistake one swallow for a summer or, in the matter we are dealing with, for the birth of the "agricultural revolution" has merely confused and clouded the issue. They have exaggerated the importance of events that were periodic for a long time, even when they did not disappear before cropping up again. We should remember the fuss Thomas More made about sixteenth-century enclosures! The influence of seventeenth-century literature (Markham, Weston, Hartlib) is also probably overestimated: the Flemish model which was referred to, and which devoured energy, could not be transposed to England where landowners had got into the habit of being stingy with labour. Innovations do not seem to have been more widespread or more assiduously adopted than on the continent[83]

[82] G. R. Fussell and C. Goodman, "Crop husbandry in the 18th century" in *History Teachers' Miscellany,* (1941). In a preliminary note in his book *Agricultural Revolution in England. The Transformation of the Agrarian Economy 1500-1850,* (Cambridge, 1996), M. Overton wrote: "...20 bushels per acre... the average wheat yield in England around 1800..."

[83] It is rash to deduce from literature of the time and periodic examples that there was a major and widespread transformation. The "convertible husbandry" which is credited to sixteenth-century England was widely practised in Brittany, and was considered pityingly in the nineteenth century, without examining its necessity and effectiveness. The fashion for orchards and kitchen-gardens in England in the second half of the seventeenth century came from France where it had been introduced previously from the Mediterranean countries. In the same period, arboriculture was a subject English and French authors had in common. Cf. J. Meuvret, "Agronomie et jardinage aux XVIe et XVIIe siècles" in *Etudes d'Histoire Economique, op. cit.*, p. 153

Eighteenth-century enclosures were the last straw. The craze that increased them at the time, the propaganda about them (Arthur Young), and the belief in their miraculous power have resulted in hiding a very simple fact that ought to have been blindingly obvious: in France, the open-field system has lasted unaltered in the centre of the Parisian Basin until the twentieth century, and has not prevented the region from flaunting a productivity rate that was the same as - and in the long term higher than - the productivity rate of the English

et seq., and Joan Thirsk: Market Gardening in England and Wales" in *Agrarian History of England and Wales,* volume VII, (Cambridge, 1985). Some of the manures that were extolled in England (and in Scotland) in the eighteenth century had been well-known in several regions of France for a long time.

These comments do not seek to "demolish" English performances, nor to argue that the situation was the same on both sides of the Channel and the North Sea. From all appearances, England had always taken advantage of the experiences of foreign countries (Flanders, Brabant, Holland, France) before becoming the "leading agricultural nation" for French authors, and especially for the physiocrats. Cf. André-Jean Bourde, *Agronomie et agronomes en France au XVIIIe siècle,* (Paris, 1967). In fact, the English (and the Scottish) still considered in 1815 that there was always something to be learned from the Flemish: John Sinclair's and T. Radcliffe's missions bear witness to this.

The comparison with France suffers from not having been conducted methodically and from being biased with preconceptions that were established at the beginning of the eighteenth century and persisted until the early twentieth century, arguing for continuous change in England and a "gross" routine in France. If we were to draw up the list of plants grown, we would see the great variety in France: rape, yellow-weed, woad, madder, maize, tobacco, tomatoes, potatoes, flax, hemp and so on. English agriculture was partial to hops (despite importing them from the Low Countries); French agriculture started to produce sugar-beet in the nineteenth century. Of course Lord Burghley's attempts at growing vines and Henry IV's attempts to grow mulberries in the garden of the Tuileries (though mulberry bushes grew well in the South of France) remain as mere anecdotes. Apples were grown in both countries, and probably went from Normandy to England.

The most crucial problem was the method of cultivation. England has been considered a more modern and advanced nation because its farms were big and believed to guarantee a higher production, and were places where human productivity was increased through an economy of labour. France was made up of small farms that were condemned *ipso facto* to stagnate. This double theorem deserves closer investigation. There were a number of "big farmers" in several regions of France: cf. J. M. Moriceau, "Les vice-rois des campagnes? Autour de quelques dynasties de fermiers-laboureurs XVIe-XIXe siècles" in *Annales Historiques Compiégnoises,* (1985). There were small holders in Devon and Cornwall. In 1870, 26% of the farms in England were smaller than 5 acres (about 2 hectares) and 28% were between 5 and 20 acres (about 8 hectares); C. M. Overton, *Agricultural Revolution in England. the Transformation of the Agrarian Economy 1500-1850,* (Cambridge, 1996), p. 175.

enclosures[84]. The other extolled innovations, that were not always extolled - the reduction of fallow-lands, the introduction of clover or turnips - did not trigger a great wave of progress, nor did they free the work of Man from the constraints of Nature. We must go further and point out how strangely ineffective all these means were that were supposed to overtake traditional agriculture. They were not capable of producing more food in England between 1800 and 1830 (not to go too far into the nineteenth century) when it had been announced that they had spread like wildfire. It was a bizarre "agricultural revolution" that had failed in its role as protector of population growth just when we would have expected it to protect growth because growth was in its hey-day[85]

The failure is often concealed by remarks about the small imports of corn at the time. This would prove that the deficit in corn production in England had diminished: it would not therefore contravene the idea that, taken as a whole, English agriculture had changed. People of this opinion speculate about the population's

[84] The absence of comparisons renders the debate about English enclosures unreal, even in the case of the well-documented debate on pages 168-192 of M. Overton's book. The chronology of enclosures offers a great deal of information. Cf. G. R. Wordie, "The Chronology of English Enclosure, 1500-1914" in *Economic History Review*, (1983), pp. 483-505. We should also remember the recriminations of the Devon peasant against the hedge whose roots were robbing his cereals of nourishment reported by J. Caird in the mid-nineteenth century. Cf. J. Caird, *English Agriculture in 1850-1851*, (London, 1852).

[85] Clover had probably been taken too hastily as the miraculous agent of the change in agriculture. Cf. P. H. Chorley, "The Agricultural Revolution. Legumes and Crop Productivity" in *Economic History Review*, (1981). Fallow land rarely remained bare in France before the introduction of clover, and there was debate about the best plant to grow on fallow land: vetch, alfalfa and so on. Fallow land in itself had its virtues. Clover, of which there were several varieties of varying efficacy, did not bring about the expected "revolution" in yields in Belgium. Cf. M. Goosens, *The Economic Development of Belgian Agriculture 1812-1848, a Regional Perspective*, (Louvain, 1993); J. Gadisseur, "Le produit physique de la Belgique 1830-1913. Agriculture" in *Histoire quantitative et développement de la Belgique au XIXe siècle*, (ed. by P. Lebrun, Brussels, 1990); M. Morineau, "Ruralia" in *Revue Historique*, 1995. "Ammonia increases harvests only when the soil contains minerals in appropriate conditions and quantities". Would this comment of Justin Liebig's not be applicable to clover too? From the data in the article quoted, written by B. M. S. Campbell and M. Overton, in 1800 the English had a *per capita* supply of 6 hectolitres of all kinds of grain, 2.40 hectolitres being of wheat and rye, whereas in 1830 they had a *per capita* supply of 4.71 hectolitres, of which 2 hectolitres were of wheat and rye.

standard of living being unchanged and want to ignore any possible fall in the standard of living. However a fall in the standard of living had been diagnosed a few years previously by R. N. Salaman. According to Salaman, the average ration of bread had diminished from 1760 onwards, and the English had made this up more and more with potatoes. Many historians have brushed aside Salaman's view quickly and at times off-handedly. But if we consult F. Morton Eden's *The State of the Poor*, a collection of menus from poor houses and work-houses published in 1797, we can see that potatoes were an undeniable feature of the diet of the working classes and, not always, of the poorest people from Cumberland to Hampshire. Potatoes figured on the Bristol market from 1712, and appeared even earlier in Lancashire, the county which holds the record for population growth in England in the eighteenth century, and the county to which the Irish flocked, those same Irish who were already partial to potatoes.[86]

Malthus' reasoning had been based only on the production of corn. He was far from admiring the potato as the"fine American"; he abhorred it as the"noxious Irish". Making allowances for the fact that Malthus tacitly disregarded the potato, his opinion on the strangulation of food under the pressure of population growth was just, but it was a just opinion in his own day, contrary to what has been said, and not about a past that was loosely reconstructed. He watched English population growth outstrip wheat harvests, even before the severe setbacks at the end of the eighteenth century and the beginning of the nineteenth century. Paradoxically for those that were patronizing towards France, it was this backward nation and "the bitterest enemy" that made up England's deficiencies in 1811 and 1812, when wheat was worth 103 and 122 shillings per quarter.

[86] P. J. Bowden: "Agricultural Weights and Measures" in *The Agrarian History of England and Wales*, volume V-II, p. 815; R. N. Salaman, *The History and Social Influence of the Potato*, (Cambridge, 1949). In *The State of the Poor*, potatoes figure in the menu of the Portsmouth docker and the Wolverhampton spectacle-maker as well as in that of the Cumberland or Westmoreland journeyman. R. N. Salaman calculated that the daily ration of wheat per head in England had fallen from 1.5 lbs. (680 grams) in 1760 to 0.85 lbs. (385 grams) about 1840, and then rose to 1.03 lbs. (466 grams) or 1.05 lbs. (475 grams) in 1914.

Therefore the famous trap still worked - if we continue to consider potatoes negligible, and here Malthus merely made the mistake of theorising beyond immediate reference. (Let it be said *en passant* that Ricardo had seen very clearly the benefits that the owners of the best land would enjoy). England avoided strangulation only by continually increasing imports which were paid for with the income from trade in general and from her industrial exports in particular: a solution that Malthus believed to be restricted to small nations like Holland but inapplicable to England.[87] We know that liberation came only in 1846 with the repeal of the Corn Laws. By then, the "industrial revolution" had taken root. It had not originated during an "agricultural revolution" and its connections with a "demographic revolution" are still to be determined. The three series of events must be examined separately before deciding whether their interaction may be confirmed or not.

We need not reconsider at length the term "restoration" used instead of "demographic revolution" for the eighteenth century. It applies just as well to England as to France. It was, at first, the reappearance of the phase and style A that we have already met: a higher birth-rate than death-rate, despite accidents *en route*. The *ancien régime* formula had become a cliché and had truncated our perspective by improperly considering as general a situation that was clearly dated, and by deterring us from looking further back at growth which had already been confirmed. Moreover, nothing prevents us from considering the particular characteristics of this "restoration" in each country, nor from considering this restoration as the prelude it was to an "unparalleled expansion" (J. Dupâquier). The later elimination of other causes leaves room for a hypothesis that of course has already been suggested, but which now gains weight: a biological hypothesis linked to bacteriological and perhaps climatic phenomena. If Wrigley and Schofield's data are interpreted in a certain way, England in the past may have benefited not from a total immunity but from a

[87] G. R. Porter, *The Progress of the Nation*, (2nd edition, 1847).

kind of attenuation of death and mortality. The death-rate in England was lower than in France - which amazed Louis Henry. If this fact were confirmed, should we not conclude that England was and always had been "protected", either because of its geographical situation or because of another yet-to-be-discovered reason? We can see that at this point any progress towards a solution requires the aid of several disciplines of which history is a merely one, and not a principal one at that.[88]

The evolution of agriculture shows neither immobilism nor a sudden "revolution". The traditional "routine" and filth on one hand, and the dynamism and modernity of "new" methods on the other, have been the *forte* of a historiography that hardly ever bothered to submit its aphorisms to a verification which involved looking at statistics. We have already mentioned these problems. In France, the empirical adaptations of buck-wheat, maize and potatoes had become very important at the beginning of the nineteenth century. Statistics drawn up from 1815 and continued without a break bear witness to the slowness of the progress to which agricultural fever should have given a powerful impetus. It is true that in the beginning there were

[88] T. MacKeown's opinion that the decline in the death-rate was a determining factor in British growth in the eighteenth century finds an interesting variation here. Cf. *The Modern Rise in Population,* (London, 1976). Wrigley and Schofield's statistical data in *The Population History of England 1541-1871. A Reconstruction,* (London, 1981) pp. 531 *et seq.* show a decline in the death-rate after 1730, but that was to link up with the figures of the seventeenth century and one or two decades of the sixteenth century. There was not a real sustained take-off until after 1820. However, if we compare population development in England and in France, in the eighteenth century, we notice that the birth-rates were more or less identical, and that it is the death-rate, which was lower in England than in France, that made the difference. Louis Henry was amazed at the English performance in this field: the alleged infant mortality rate for the period from 1550 to 1649 was only 129/ooo whereas in France it was 172/ooo. England would appear to have enjoyed a "modernity" of which Louis Henry would have liked confirmation. Cf. his article written with D. Blanchet, "La population de l'Angleterre de 1541 à 1871" in *Population,* (1983), p. 811. The solution of the riddle calls for experts in several fields, as does the examination of the global conditions of both evolutions: geography (climate, soil, etc.), botany (phytobiology, environment), the medical situation (epidemiology, endemicity, prophylaxis, hygiene, etc.). The distinctions required were the subject of a book by P. O'Brien and C. Keyder, *Economic Growth in Britain and France. Two Paths to the Twentieth Century,* (London, 1985).

only hazardous attempts by trial and error and it took time to create a rigorous scientific discipline, to say nothing of the problem of making laboratory discoveries available to the peasants. Perhaps there was no breakthrough without the assistance of industry and general development - which would reverse the classical order of appearance of the phenomena.[89] What was the situation in England? If endorsed, B. M. S. Campbell and M. Overton's figures for the distant past would be evidence that agriculture in England had lagged considerably behind agriculture in north-west France and even further behind agriculture in Flanders in the fourteenth and sixteenth centuries. The increase in yields appear to show that it had caught up over 200 years. As far as food provisions for the population are concerned, we do not see that England was vastly superior to France at the end of the eighteenth century, either in *per capita* quotas of the principal cereals or, in Paris and London, in the sale of meat, since the cattle at Smithfield and at Poissy or at Sceaux were about the same weight.[90]

Performances must be judged in terms of density which was

[89] This was the opinion of M. Augé-Laribé, *L'Evolution Agricole de la France*, (Paris, 1912). Nevertheless, the efforts of the first agronomists had not been entirely in vain. Although belatedly, they had promoted a science worthy of the name. They had worked by trial and error to select seeds, prepare the land, decide on crop rotation and so on. The fertilisers they recommended were for a certain period in most cases no different to those that were used traditionally (crushed bones, refinery residue, guano). There was a substantial take-off when chemical fertilisers were used.

[90] According to B. M. S. Campbell and M. Overton in "Production et productivité dans l'agriculture anglaise 1086-1871" in *Histoire et Mesure*, (1996), volume XI., there were about 2.40 hectolitres of noble cereals (1.93 hectolitres of wheat and 0.47 hectolitres of rye) for every person in England. During the Consulate and the Empire, the French administration reckoned on a ration of 3 hectolitres, similarly of wheat and rye, in every *département*, and in fact that was the case in most *départements*. Let us compare the weight of animals (cattle, sheep and pigs) at Smithfield market (according to Eden) with those in Paris (according to Lavoisier). In London, the average weight of an animal varied between 67.6 and 71 kilos, and in Paris between 62.8 and 68.9 kilos. We should make corrections to the weights used to calculate the average in both cities, bearing in mind the quality of the animals and the fact that there was no distinction between cows and cattle at Smithfield. If we accept these corrections, there was more meat available in Paris than in London. We should note that cattle differed in weight by only about 20 kilos (800 lbs. in England and 700 lbs. in France), with the above-mentioned reservation

higher in the north-west quarter of France than in England (78 inhabitants per square kilometre as against 66) and, of course, in Flanders. This situation had social aspects which are not an issue at the moment. They developed in opposite directions in the nineteenth century, as did attitudes to corn imports. We would require comparisons, formulated differently, to follow them. But when England began to draw up agricultural statistics in 1892, equality seems to have been maintained in the question of yields.[91]

There is no malignity in these exercises of synoptic appraisement. They are part of a problem that has been illustrated by many historians, some recently, and they are essential to throwing light on and defining the areas of real superiority[92]. Wages are another factor to be considered. It has been generally agreed, at least since Arthur Young, that in this regard the English enjoyed a great advantage over the French. Yet, if we reconsider the question, this is not the case. A craftsman or a building foreman in London in the 1780s earned 38 pence per day, about 81 French sous. His Parisian counterpart earned only 60 sous per day. But the difference in prices helped to offset the difference in wages. In London, a hectolitre of wheat cost the equivalent of 19.72 *livres tournois* (the *livre tournois* was a franc worth 20 sous minted at Tours), whereas in Paris it cost 15.06 *livres tournois.* And so in both cities a worker could obtain about the same quantity of grain: one fifth of a hectolitre. This gives us a better idea of

that there were a number of cows among the cattle in England. Cf. Lavoisier, *De la richesse territoriale du Royaume de la France,* (1791) and Armand Husson, *Les consommations de Paris,* (1875). On page 114 of his book, M. Overton admitted that the size of animals in England had not made any progress at the end of the eighteenth century - which would tend to prove the futility of the innovations (clover and other fodder, the enclosures and so on) that were supposed to have improved animal-rearing. Bakewell succeeded in improving only certain breeds of sheep.

[91] It is a pity that M. Overton did not take his research to 1892. The comparison stayed interesting despite structural changes in England.

[92] Of course it is not a question of disparaging England, nor of stripping her of her very real superiorities which flourished in the nineteenth century. Our research has to do only with measures. It would be just as incongruous to attribute an advantage to France because of her vineyards.

living conditions than the cost-of-living calculated by E. H. Phelps Brown and S. V. Hopkins[93].

To be complete, we should extend the comparison to the provinces. The complexity and the unreliability of the appropriate data make the task impossible. We would have to consider region by region, profession by profession, income by income, while endeavouring to compare only those situations that were really comparable: gentlemen farmers and big farm-workers, petty peasants who lived solely off their land or practised a trade on the side, workers from such and such a workshop or factory (when there were such things). Let us remember that in confining research to traditional (which does not mean archaic) industries, recent studies have restored a certain balance to the English and French situations in the eighteenth century [94]. Hence the interest in comparing wages and population behaviour taking each area at a time: the famous Vale of Trent could find a counterpart in Vermandois, in the Cambrésis region and in Flanders. A study of Nottinghamshire would have deserved attention both for its own merits and for its

[93] The fact that French salaries were lower than English salaries has been stated by Arthur Young who calculated that English salaries were double: 20 sous per day in France, and 40 sous per day in England (after conversion, taking a "national" average). The French figures are taken from L. Biollay, *Les prix en 1790*, (Paris, 1886); E. Levasseur, *Histoire des classes ouvrières*, (Paris, 1910); Haim Burstin, *Le Faubourg Saint-Marcel à l'époque révolutionnaire*, (Paris, 1983). The English figures (which are repeated) are taken from the already-quoted works of E. Gilboy, E. H. Phelps Brown and S. V. Hopkins, P. Deane and B. R. Mitchell. It should be noted that the London bread prices collected by Beveridge and published by Deane and Mitchell are not to be considered. Established by a judicial process, they do not reflect reality at all. The real prices found in Eden's book *The State of the Poor* (1797) are a lot higher, including those in places near London.

[94] T. Markovitch, *Les industries lainières en France de Colbert à la révolution*, (Geneva, 1976) was largely responsible for changing the opinion about the vitality of French industry. Recent regional research has discovered rural industries in all the French provinces: in the Cambrésis region (D. Terrier), in Franche-Comté (A. Mayaud), in Perche (C. Cailly), in the Ile-de-France, in the Beauce region, in Gévaudan and so on. There is a provisional list in Denis Woronoff, *Histoire de l'industrie en France*, (Paris, 1994). The term "proto-industrialisation", invented by Franklin Mendels, is not accepted by all historians and in our opinion is inadequate. Although interesting at the time of its publication, François Crouzet's book *De la supériorité de l'Angleterre sur la France*, (Paris, 1985) is outdated nowadays in many places.

place in England as a whole. E. A. Wrigley and R. S. Schofield's programme dissuaded them from undertaking regional research. It is regrettable, and it would be even more regrettable in the case of Lancashire, the most dynanmic county both from the point of view of population and of the economy, where wages appear to have increased (had they thwarted the pauperisation that was in progress for example in London?) and where the "industrial revolution" happened, that industrial revolution whose potential blessings have been proclaimed so often and which seems to be the real discriminating factor between England and France.

The south of England provided E. H. Phelps Brown and S. V. Hopkins with the data for their analyses which were then used by E. A. Wrigley and R. S. Schofield. Up to what point was the south of England, which had been the least affected by changes in industry, representative of the country as a whole? It is impossible to know. We must be satisfied with what we are told. We shall not bring up the time lag again, which many people found mysterious, a *vis explicativa* or a *deus ex machina*. Let us take the case of the lowering of the average age of females when they married which might have been considered one of the features of less exclusively rural regions. It would have been the essential lever for demographic growth, giving rise to an increase in the birth-rate. The birth-rate did in fact increase after 1700 and after 1750, by way of contrast with a previous drop which still requires satisfactory explanation: the increase in the birth-rate, we are told, was a consequence of the lowering of the average age of women at their first marriage from 26.5 to 24.9 years old. However, the birth-rate did not reach 37/ooo or 38/ooo until the end of the eighteenth century. The French birth-rate between 1784 and 1789 was 38.8/ooo. which is not very different from the English one, but in France at that time the average age of women at their first marriage was 26.5 years. Should we not infer from this somewhat surprising comparison that there was some kind of birth-control at that time in England, perhaps inherited from the second half of the seventeenth century, which obviously had nothing to do with the preventive brake recommended by Malthus?

Only detailed research on fertility could settle the question once and for all[95]. The death-rate rose between 1719 and 1742 and then fell again, causing the population to swell and break all records. However real wages diminished throughout this period and it became increasingly difficult to obtain food. Yet this did not stop population growth. A similar situation was found in France despite the difference in intensity: the hypothesis of a biological "lull" (which lasted a long time) reappears as the most credible[96].

We are not forgetting Lancashire and the "industrial revolution". A few years ago, no-one would have questioned the existence of the industrial revolution: there was debate only about its causes (and no agreement was reached on the subject). Attention was then turned to when the industrial revolution began: many historians were of the opinion that in Manchester, for example, it began in the 1790s. Other historians believed it began in the first third of the nineteenth century in England. Yet others dated it even later, but we shall not concern ourselves with this for the moment. Historians have puzzled over how the industrial revolution happened: did it happen all at once or did it happen gradually? They debated its very existence as a "revolution". They are all problems which have been transposed to the other "revolutions": the demographic revolution and the agricultural revolution. Some famous historians have written tomes on the subject, and we are reluctant to enter the fray. However a few simple remarks seem helpful.

England was not without industry before the mechanical inventions of the eighteenth century and the building of steam-

[95] Between 1645 and 1679 the birth-rate in England remained lower than 30/ooo. The average age of women at first marriage was 26.5 years. The study of the fertility of married women in the eighteenth century could merely answer the questions posed by the comparison that has just been made: was there a longer interval between births? Did women stop having children at a relatively early age?

[96] In the eighteenth century England had seen a pauperisation process similar to that in France. The phenomenon did not involve the whole of the population any more in one country than in the other, and there was some economic advancement and enrichment in both countries. Once again, the situation of certain regions (Lancashire, the Midlands) and dynamic ports (Liverpool and Glasgow) would merit specific research to find out whether the inhabitants' lot had improved, and, if it had, by how much.

engines. English industry had developed significantly and maintained a fairly sustained level of production, generating profits to a greater or lesser degree in rural and urban areas. However we will not call this proto-industrialisation because industries developed in different ways and, indeed, failed to develop at all[97]. In this period discoveries were made that were staggered over the years, involving different sectors and with varying results. The technical factor in this process is undeniable, as is the time factor in their adoption. The strength of the new inventions lay in their ability to multiply goods and to lower production costs and potentially lower retail prices. Population was a secondary consideration to start with: labour requirements were originally moderate. When labour requirements increased - and growth had different rhythms in different sectors - they were easily satisfied by surplus population moving from the country to the towns and by immigrants from Ireland and Scotland. Now let us consider developments in the countryside. The "agricultural revolution" as we have seen is hardly sustainable. Numerically, the number of peasants did not fall between 1700 and 1850. But it was already small, with consequent increased productivity per worker. With an unchanged social structure, the increase in population in the country could not be absorbed locally. Under push and pull effects, the population headed steadily towards the towns and the factories.

It was a good thing to produce, but products had to be sold. The quest for and the promotion of outlets were as essential to industrial development as technical progress was. The market was not *a priori* wide-open, ready to swallow up whatever was offered. It was subordinated internally to the purchasing power of the population which in turn depended on income. It was sometimes stimulated and at other times hampered by the cost of essential foodstuffs, and was obviously sensitive to the low cost of

[97] The proto-industrialisation debate did not really take on in England. Cf. J. Schelleken, "Nuptiality during the first Industrial Revolution in England: explanation" in *Journal of Interdisciplinary History*, (1997). The paper by J. D. Chambers, "The Vale of Trent 1670-1800. A Regional Study of Economic Change" in *Economic History Review* (1951) could have led to it. It seems that there were obstacles to generalising about the whole of England and indeed Great Britain.

other purchasable goods. The market also included external customers: foreign countries and colonies both before and after their independence. The U.S.A. was a very important consumer. This type of trade was based on a kind of exchange, conditioned to a greater or lesser extent by the rules of exclusivity and/or commerce. The fluidity of transactions was never guaranteed in advance and for ever; this is proved abundantly by the many crises when the market was choked with goods and workers lost their jobs. England had developed into a prime industrial power, and when she felt the pressure of the high price of cereals, she took the plunge and liberalised the importation of corn, which was tantamount to subjecting landowners and agriculture to competition. On the other hand, the feed-back system became stronger and exports of manufactured goods benefited. Both at the same time and at a later date, another transformation took place that would also have deserved (and even more so) to be called "revolution", if it too had not required time: the transition to an "industrial society" of which peasants were only a very small part. By giving the changes brought about by modern industrialisation their full chronological and human dimension, we sidestep the problem of an "industrial revolution" whose existence was more or less artificially acknowledged. We see changes over the long term, and we can follow their ups and downs[98].

[98] The expression "industrial revolution" was first coined by Arnold Toynbee's students who were looking for a title for an edition of one of Toynbee's courses. The expression was used again by P. Mantoux, but has always caused huge arguments. It has been defined in time, but the dates have been contested, and the search for causes has constantly failed and so been disappointing. Cf. among others, D. S. Landes, *Unbound Prometheus,* (1969); P. Mathias, *The First Industrial Nation: an Economic History of Britain 1700-1914,* (1983); J. Mokyr, *The Lever of Riches,* (1990). Nowadays there is quite a strong tendency to link the industrial transformation to the period before 1770 or 1750 and, at the same time, to deny the appearance before the nineteenth century of certain forms of change that could only happen when a "large-scale industrialisation" was already well-established. The rise of the cotton industry seemed to be an isolated case in the eighteenth century, and industrialisation appears to have spread region by region. Among those who hold this mitigated view are S. Pollard, *Peaceful Conquest. The Industrial Revolution,* (Oxford, 1981); N. F. R. Crafts, "The Industrial Revolution" in R. Floud and D. MacCloskey: *The Economic History of Britain since 1700,* (Cambridge, 1981). Development outside England poses new problems for every country concerned.

6. Malthus Interruptus

We were said that Malthus' theory was applicable to an era before his lifetime, but was obsolete in his day. A negative conclusion must be opposed: retro-Malthusianism has failed.

The analysis of events prior to the Black Death and developments in France and England have led us to examine other events connected with demographic development in the eighteenth century and later. It emerged that the great clichés were rather inane and that a revision was called for, since events had not happened as had been maintained over and over again. It then became apparent that we must change our way of understanding human development by placing it both in the wider biological environment and in its own context.

This may disconcert us in two ways. Demographers, economists and historians in their wake chose sophisticated methods of research which boiled down to often complex equations, and they considered invalid any approach which did not fit this method. However the failure of their method - recognised on many occasions and most recently by R. D. Lee and J. Y. Grenier in their essays - should prove to them that there is a fault and/or a gap in their reasoning[99]. Mànipulating and, even worse, twisting variables and coefficients is not in itself the solution. We must rise above the subject to recognise and reintegrate those aspects that have been ignored. This means that observation must take precedence over speculation, even when bedecked with mathematical festoons, that observation is the

[99] R. D. Lee, "L'autorégulation de la population: systèmes malthusiens et environnement stochastique" in A. Blum *et al.*: *Modèles de la démographie historique* (Paris, 1992) pp. 109-127 and J. Y. Grenier, *L'économie d'ancien régime*, (Paris, 1996) p. 427: " No regularity, either of form or of reproduction is ever postulated... The paradox results from introducing into the heart of a temporal model an aleatory dimension that is justified by the absence of both well-defined equilibrium and of efficient gravitation mechanism". Grenier applies this comment to a problem of economic history but it may be easily be applied to the population trends which have been proposed. It is strange that Grenier did not include the population factor in his book, when there was clearly a place for it.

most expedient resource for re-making calculations, and that observation is necessary.

This last statement is exactly where our research has brought us to. It implies, in effect, that as far as demographic evolution is concerned, we have to accept as a hypothesis the existence of a factor that is independent of Man, when until now we have always looked for human factors. It should be noted that we do not scorn quarantine, preventive measures, progress in hygiene, medical discoveries (when they acquired efficacy) and the problem of subsistence, and we do not prejudge the future and the outcome of science's on-going battle against infection agents. But the fault against which our observations put us on our guard is a blind, stubborn disregard of external conditions, which were *ipso facto* inescapable.

Louis Henry ended his commentary on *The Population History of England* with a very important consideration: "As in all natural sciences, several teams should be able to repeat and verify the observations made by another team; in research on historical demography which involves a whole country, another team should undertake the same research using a different sample. As far as we know, that has never happened anywhere"[100]. Was this a pious hope? In the absence of an intensification of this criticism, or while awaiting it, some first elementary tests were called for. And they applied just as well to the concept of the "industrial revolution" as to that of the "agricultural revolution" or the "demographical revolution", however much Wrigley and Schofield's great work may be admired.

During his lifetime, Malthus was criticised more than he was praised. His reappearance in the forefront of the demographic scene is due to a misunderstanding. By giving retrospective value to his intuitions, we have set him up as a great "classical" thinker, despite the fact that he was mistaken. Malthus, in fact, was first of all an essayist. There is no doubt that he made sure he collected reliable data from his contemporaries: but he was nonetheless prompted by a fundamental intuition and conviction. More than Godwin and

[100] L. Henry, *art. cit.*, p. 819.

Condorcet, his target was Pitt the Younger's Poor Law Bill. He proceeded in accordance with the intellectual habits of his time: scientific rules had not yet come into the field. It would be as unfair to reproach him for his ideas as it would be to do so to, say, the physiocrats. It is equally unfair to bear down on him because he did not foresee developments that were still merely in gestation and whose future outcome escaped everyone. But fairness in regard to the man does not prohibit our considering his work with the desired distance. We have seen that Wrigley's and Schofield's statistics did not contradict him on the rapid growth of English population in the late eighteenth century and the early nineteenth century. We should also bring to notice his misreading of facts that ought to have been obvious to him. This is not to stir a hornet's nest, but to bring him back to a human dimension, for *errare humanum est*[101].

Malthus expressed satisfaction that there was a preventive brake in England to his taste: "Farmers and petty tradesmen urge their children not to marry until they have a farm or a business that enables them to support a family". However the age at marriage became lower in his time and in his country, both for males and females. He did not realise this and he strongly believed that there still existed a fondness for celibacy, "a useful sentiment which is to be encouraged", "although to tell the truth English legislation in favour of the poor tends to destroy it"[102]. When he

[101] In the unpublished pamphlet of 1796, entitled *The Crisis, a View of the Present Interesting State of Great Britain by a Friend of the Constitution*. Malthus' first aim was to challenge Pitt the Younger's government. The Poor Law Bill was part of it, although it was included in a wider protest. According to Empson, who had read it, this pamphlet contained Malthus' first remarks on the population principle. Cf. P. James, *Population; Malthus, his Life and Times,* (London, 1979), pp. 50-54. Two years later, in his *Essay*, Malthus again mentioned the Poor Law Bill, which had, moreover, been thrown out. Cf.note 65.

[102] Malthus, quoted in the French version of the *Essai* (1803, chapter VII). And again: "We can thus see that the preventive obstacles which forestall population growth have a great deal of influence in England. We can come to the same conclusion if we examine the registers connected with the Population Act" and " a glance at English society is sufficient to convince us that the obstacles that forestall population growth and that are called preventive obstacles strongly prevail there...". Compared to a geometrical progression, there is no doubt that this is so, but...

travelled to Norway, he was very enthusiastic about the system of employing farm-servants which he believed contributed to making young people postpone marriage for a long time. Malthus was not aware of the opposite process that was under way in the country in England. According to Ann Kussmaul, the number of male and female servants fell in the second half of the eighteenth century, and she believed this change was a powerful factor in the increase in marriages[103]. He took Adam Smith's side against the French physiocrats by recognising that industrial work had a positive value. But he remained faithful to his agrarian ideal and refused to admit that industry could improve living conditions: only agriculture could do so. Continuing logically in this conviction, he refused to envisage salvation through trade which was good only for "a small country with a large navy and great inland accomodation for carriage" (Holland). He took up Arthur Young's prompt judgements on France which was eminently to be condemned for being a land of small farms and not of large English-type farms. He skipped over the distress of the last years of the eighteenth century and amazingly blamed the poor and the Poor Laws for the high prices of corn, without, if I am not mistaken, touching on the problem of the roots of poverty[104].

The way by which he came to formulate his theories can be seen fairly easily from Pitt's Poor Law which was probably the detonator. Malthus saw families with a lot of children living in extreme poverty, and saw a connection between this situation and the aid given by parishes to their needy. It was the same charity which had incited the parents to marry and have children, safe as as they were in the knowledge that they could count on

[103] A. Kussmaul, *Servants in Husbandry in Early Modern England*, (Cambridge, 1981).
[104] It is the problem of the "irredentism" of poverty that we spoke of in a symposium in Clermont-Ferrand in 1991. A record of the proceedings was not published. Cf. les Actes, *Pauvreté et assistance en Europe à la fin du XVIIIe siècle et début du XIXe siècle*, (J. Carré ed.), (Geneva), 1993. Cf. also Catherine Duprat, *Le temps des philanthropes. La philanthropie parisienne des Lumières*, (Paris, 1993). Malthus had envisaged in 1796 a sort of assistance at home in the form of distributing piece-work.

local state charity. Therefore giving them this encouragement or alibi was to be avoided. Malthus then generalised his ideas with a pantograph. The population, left to its own devices, increased continually until it exceeded the available food resources. A glance at the American censuses provided him with the "law" of geometrical and arithmetical progressions. The elasticity of the population in the New World might have moderated his pessimism. By putting himself at the limit, in a situation where the population was mature or senile, he again found the fatal dead-lock. Malthus was careful to distinguish on the one hand the young nations that still had a future and plenty of space to be occupied, and on the other hand the old nations - in Europe - which had reached saturation. Despite the beginnings of transatlantic travel, he ignored contributions from one continent to another, and the relief the potato could bring. The only solution lay in limiting the number of births. This result could be obtained by the preventive brake of making people marry later in their lives, since Nature seemed to have been freed from using the positive brakes she had used in the past[105].

The above plan shows clearly the branches of Malthus' philosophy, and the points on which even during his lifetime there could be no unanimous agreement. Let us remember for the third time that certain characteristics of demographic growth in England in the late eighteenth century and the early nineteenth century partially bore out his judgement and that uncontrolled population development had of necessity to be stopped brutally by the closing of a trap. That this trap was, after all, merely an intellectual trap escaped the neo-Malthusians as they looked back. Let us make a polite concession to Malthus' vocabulary, merely of form, without compromising the essence: in 1798, the positive brake had slackened everywhere in the world, and the preventive brake had slackened in England, hence the rush in growth. The preventive brake, on the

[105] Even before Malthus, England had already received corn from her American colonies and rice from Carolina. Quantities were still small, but the opportunity existed and American independence did not interfere with this trade.

other hand, had begun to tighten again in France, in a way Malthus would never have approved of. It was the premonitory sign of another kind of development, of a phase and style which would reach a sizeable part of the planet and which would take us a long way from the individual and collective behaviour of the past[106].

Will it be judged pretentious to quote Francis Bacon, Lord Verulam, in his *Novum Organum?* "If, in the past centuries, the right way to seek for truth had always been pursued without acquiring any more real knowledge, it would be a rash hope to believe in the possibility of future progress. But since the wrong road has often been travelled, and the greatest amount of energy has been expended in vain, we must conclude that obstacles do not arise from circumstances beyond our control, but from a false direction given to our intellect, a direction that it is possible to modify and improve. Above all, we must reveal the errors, because every error we discover in the past gives us added hope to understand in the future..." We should use the imperative advice that is given us: we should always question ourselves and our work[107].

[106] English historians used ordinarily the terms "demographic revolution" and/or "vital revolution" when referring to the population increase that began in 1736 and has continued ever since. However, French historians tend to use the term "demographic revolution" or sometimes "transition" when they refer to French population's behavioural change, birth control and the spread of so-called "Malthusian" practices - a process which was already well-implanted in certain places in the eighteenth century, and a process all set for great success and destined to spread sooner or later throughout Europe. This double charge brings with it some risk of confusion and, above all, some risk of symmetrical occultation. We should remember that the strong growth in England in the eighteenth century was not the only strong growth in Europe and that in many other countries the hypothesis of growth being associated with an "industrial revolution" or an "agricultural revolution" does not exist. Cf. for comparisons with northern Europe: Michael Anderson, *Population Change in North-Western Europe 1750-1850,* (London, 1988). The Mediterranean countries should not be excluded from comparisons. Cf. e.g. southern Italy and Sicily.

[107] Book I, paragraph 94. Chosen by Liebig as an epigraph to his book, *De la pratique et de la théorie en agriculture,* (Lille, 1857). This paper did not aim to deal with all the problems related to the subject and the conclusions remain open to discussion and to further verification.