

## **PLAGUE AND CHANGES IN MEDIEVAL EUROPEAN SOCIETY AND ECONOMY IN THE 14<sup>TH</sup> AND 15<sup>TH</sup> CENTURIES**

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Diseases have always been inherent in humankind although not always have they developed into epidemics widespread enough to affect the history of human societies. Sometimes, however, it has happened that a certain endemic disease would become epidemic or even pandemic and then its effects spread over many spheres of human life and were felt for a long time.

The vast majority of diseases is endemic and they rarely change into epidemics or pandemics unless favourable conditions exist, such as the fact that the whole population is not naturally immune to a disease. Other factors conducive to the outbreaks of epidemics or pandemics include poor hygiene, inadequate methods of prevention, poor quality of food, high population density, greater mobility of people, but also the way the disease itself is transmitted.

The ancient world was accustomed to periodic outbreaks of epidemics. During the Peloponnesian War, in the years 430 - 425 BC the plague decimated the population of Attica. Between AD 165 and 180, smallpox epidemic reduced the population of Italy by 20-25 per cent. In the years AD 251-260 territories of the Roman Empire were attacked by another epidemic, probably the measles. Later on, in the years 541-760 the whole Mediterranean region and the Near East suffered from the plague appearing at 5-10-year intervals. The existence of large urban centers, such as Rome, Constantinople, Ephesus, Alexandria, and also great population density in some rural areas, such as in Syria and Gaza in the 6th century, contributed to the fact that diseases spread easily and quickly. Attempts were made in ancient medicine to explain the reasons for the outbreaks of diseases. Hippocrates (5<sup>th</sup>-4<sup>th</sup> century BC) and then Galen (2<sup>nd</sup> century) assumed that epidemics resulted from the contamination of the air by a poisonous vapour, miasma. To manage the disease, the air should be cleaned, while people were advised to escape from the infected areas. In religious terms, epidemics were interpreted as gods' (in pagan societies) or God's (in Muslim and Christian societies) vengeance on people.

After the year 760 neither the Mediterranean region nor other parts of Europe were struck by any major epidemic. As it coincided with fast economic development, Europe entered a long period of demographic growth which resulted in the fact that at the beginning of the 13<sup>th</sup> century the population reached 70-80 million. One of the side-effects of that considerable growth was that Europe had gained one of the important prerequisites for another outbreak of an epidemic.

Moreover, medieval medicine did not go any further than ancient physicians in explaining the reasons and finding effective remedies and cures for the epidemics. Standards of hygiene in the Middle Ages appeared high enough to prevent diseases as medieval Europeans, contrary to popular beliefs, bathed quite often. However, contact with domestic animals, which were frequently kept in the part of the house reserved for human activity, exposed people to animal-related diseases passed to humans via insects.

In the mid-13<sup>th</sup> century, Europe was hit by a severe crisis in agriculture caused by the depletion of the amount of land that could be, with the use of existing technology, turned into arable land. At the same time, economic boom between the 10<sup>th</sup> and 13<sup>th</sup> centuries had resulted in the rapid growth of population in Europe and population density in some regions, for instance in Tuscany, reached 40 people per square kilometer. Such high density, in spite of the fact that population growth was halted in the second half of the 13<sup>th</sup> century, created very favourable conditions for potential epidemics.

Demographic pressure on economy led, additionally, to the lowering of the general standards of living. The need to provide food for the large number of people caused that grain production was intensified at the cost of animal husbandry. Pastures and wasteland were turned into arable land. Consequently, agriculture became dominated by grain production and people's diet consisted mainly of products rich in carbohydrates, while the consumption of animal protein decreased. The fact that agriculture in many regions was dominated by grain production was likely to lead to the outbreaks of famine should any climatic anomalies occur or due to over cropping. And indeed, in the second half of the 13<sup>th</sup> century, impoverishing of land and cooling of climate during the so called Little Ice Age resulted in dramatic decrease in agricultural output. In some regions, yield ratio dropped from 1:8 to 1:4, which allowed only for a very small food reserve to be built for the future. Crop failure inevitably caused famine. Another problem was that at the same time in some west European countries suffering from overpopulation, the supply of labor was very high, thus, the wages of unqualified workers fell.

In the second half of the 13<sup>th</sup> century, crop failures caused by cold and rainy weather occurred every five to ten years (1272, 1277, 1283, and 1292). Even more detrimental were the prolonged periods of harvest failure, continuing for several years in various parts of Europe between 1315 and 1319 and between 1345 and 1348.

The effects of 1315-1319 crop failure were disastrous. It is estimated that in some regions of Europe about ten per cent of population died during the terrible famine of these years. The great famine of the years 1345-1348 was, by the same token, an introduction to the approaching Black Death.

The beginnings of the epidemic date back to about the year 1320 when it first struck in Central Asian steppes. In 1331 the epidemic reached China where it is

estimated that about 60 per cent of population might have died. In 1346, the disease was first recorded in the Black Sea region and Asia Minor. In 1347, it was brought to Italy, most probably by one of the merchant ships from Crimea. It is not certain whether it was the plague, its mutation, or maybe some other illness. What is certain, however, is that its effects on Europe were catastrophic. In the years 1347-1351 (during the first strike of the epidemic) in some regions of Europe, the disease killed around 50-60 per cent of population and this proportion was similar in all social and age groups. After the first, most disastrous occurrences, the epidemic would sweep Europe again in the second half of the 14<sup>th</sup> and in the 15<sup>th</sup> centuries every several years. Its death toll then was lower and rarely exceeded 15 per cent of population. Another difference between early and later outbreaks was that in the latter these were mostly children who died, which adversely affected chances of quick restoration of demographic balance. At the end of the 15<sup>th</sup> century, frequency of the outbreaks of epidemic decreased to every 15-20 years, and so did its territorial incidence. The last European outbreak was recorded in 1720 in Marseille; but thanks to effective preventive measures, the disease did not spread outside the city.

As a result of all the outbreaks of the epidemic in the 14<sup>th</sup> and 15<sup>th</sup> centuries, the population of Europe decreased from 70-80 million in 1290 to about 20-40 million in 1430, and remained so until the end of the 15<sup>th</sup> century. For some west European countries, it meant a return to the demographic situation they were back in the 10<sup>th</sup> and the 11<sup>th</sup> centuries.

This demographic catastrophe resulted in many profound changes in European economy. England was one of the regions where the effects of the epidemics were most discernible and the changes that took place there vividly illustrate the dire consequences of medieval epidemics for the European economy and society.

At the end of the 13<sup>th</sup> and at the beginning of the 14<sup>th</sup> century, two phenomena characterized the world of English peasants. First of all, legal status of peasants was much diversified. The group included the so called freeholders, villains, i.e., unfree peasants bound to their lords through service and dues, and serfs. None of these groups outnumbered others. Secondly, the majority of peasant farms did not exceed the size of 0.5 yard land which is about 6-7.5 hectares. Taking into account the productivity of medieval farming, farms smaller than 0.5 yard land were not self-sufficient and peasants were forced to search for some alternative sources of income. They could hire themselves out to wealthier neighbors who had more land or to the landlords. After harvest, some peasants found seasonal employment in craft, mining or fishing. Women would find permanent employment as weavers. In some regions of England, as many as 70 per cent of peasant households relied on additional income from employment outside agriculture. It resulted in very high seasonal supply of labor and thus low wages.

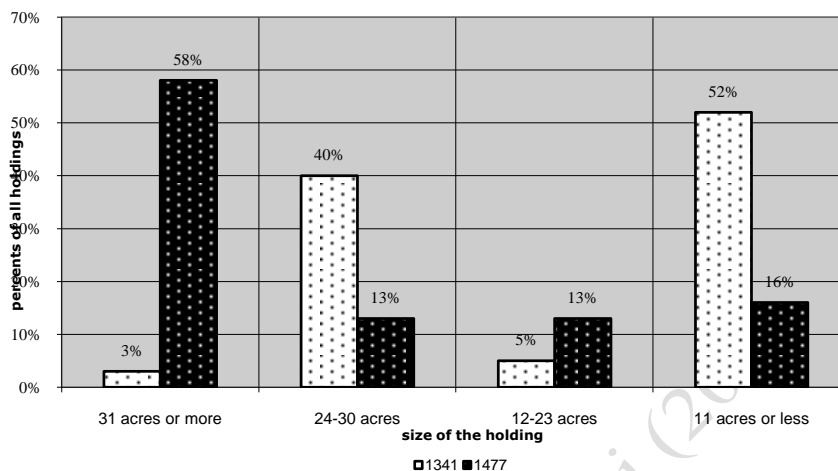
Low wages and small farms were the two factors which kept young people from becoming financially independent. Consequently, they tended to get married

late. Men married usually at the age of 28, while women at the age of 23. Financial status affected also the number of children in peasant families. Less affluent families usually had two or three children; wealthier peasants had about five children. Families of the latter kind were, however, rather rare. Assuming that a wealthy peasant was the one whose farm's size was at least 1 yard land (12-15 hectares) and whose annual income ranged from 1 pound 18 shillings to 2 pounds 11 shillings, the whole group would include only a few percent of peasant population.

Throughout the period of 150 years after the Black Death, European agriculture went through a series of profound changes, basically in the size of peasant holdings and the crop structure. In terms of their legal status, most west European peasants, English ones included, became freemen. Agriculture was no longer dominated by grain production because of the decreasing demand for cereals caused by the fall in the number of consumers. Grain prices went down as well. Since the prices of other farm produce and animals remained unchanged, the popularity of animal husbandry increased. Some peasants started to grow plants used, for instance, to dye textiles. Profitability in agriculture also increased although the change might not have been very spectacular. Average income generated by a 1-yard land farm rose to 3 pounds 6 shillings.

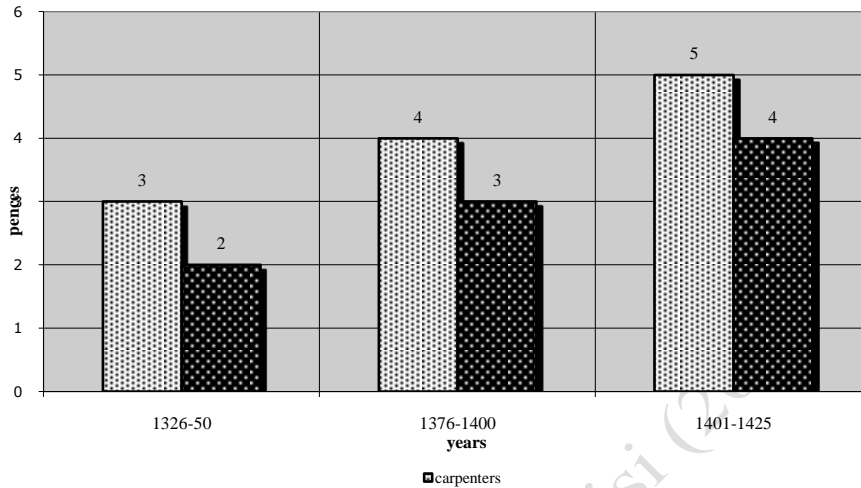
The comparison between early 14<sup>th</sup>-century and late 15<sup>th</sup> century sizes of peasant holdings and diets of agricultural laborers serves as the best illustration of changes that took place in west European agriculture. A place where significant changes in the structure of peasant holdings took place was Stoughton in England (Chart 1). During 130 years it transformed from a village consisting mostly of small, non-self-sufficient farms whose size rarely exceeded 11 acres to a village where the majority of holdings were larger than 30 acres. This economic transformation translated into social changes in the said village. The experience of wealth, which meant having annual income of about 2 pounds, which in the first half of the 14<sup>th</sup> century had been available to 3 per cent of peasants, had become the reality for more than a half of all the peasants in Stoughton.

Chart 1. Changes in the size of peasants' holdings in Stoughton, Leicestershire between years 1341 and 1477.



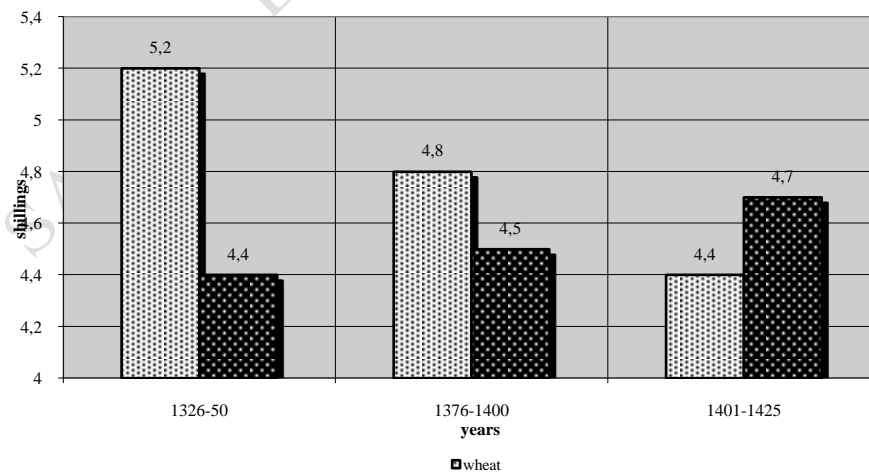
A group which benefited most from the economic changes caused by plague was a group of agricultural labourers whose wages (both nominal and real value) increased significantly. Shortly after the first outbreak of the epidemic in England, France and the Netherlands, there was a sharp rise in the wages of unqualified workers in the country and in towns. During the following several years, wages decreased slightly, but then, after another outbreak of plague, they started to rise again and the trend continued for the following 100 years. Comparison of data showing daily wages of laborers in the 14<sup>th</sup> and in the 15<sup>th</sup> centuries reveals the rise of 70 to 100 per cent in nominal value of wages (Chart 2). The rise was the largest in the wages of unqualified day-laborers, whereas qualified workers experienced a more modest rise.

**Chart 2. Daily wages of carpenters and labourers in Essex 1326-1425. Wages in pences per day of work.**



Only when food prices are juxtaposed with earnings can the significance of the rise in wages to the standards of living in the 14<sup>th</sup> and 15<sup>th</sup> centuries be noticed. Chart 3 presents changes in the prices of wheat and barley between 1326 and 1425. It is visible that while the wages increased, the price of wheat (used for baking bread) dropped and the rise in the price of barley (used for brewing beer) was negligible. Concluding, during the analyzed period of 100 years not only did the nominal but also real value of wages increase.

**Chart 3. Changing prices of wheat and barley in Essex (England) in years 1326-1425. Price in shillings per quarter.**



One of the consequences of higher real value of wages was the change in people's diet. In medieval Europe, the consumption of wheat, which partially replaced rye, increased. Moreover, the consumption of beer also went up; and people started to eat much more meat, which partially replaced dairy produce as a source of animal protein. Changes in diet of agricultural labourers are shown in Chart 4 which focuses on fluctuations in financial and caloric value of particular elements of diet between the middle of the 13<sup>th</sup> and the first half of the 15<sup>th</sup> centuries.

Chart 4. Changes in diet of agricultural workers in Sedgeford, England, from XIII to XV century.

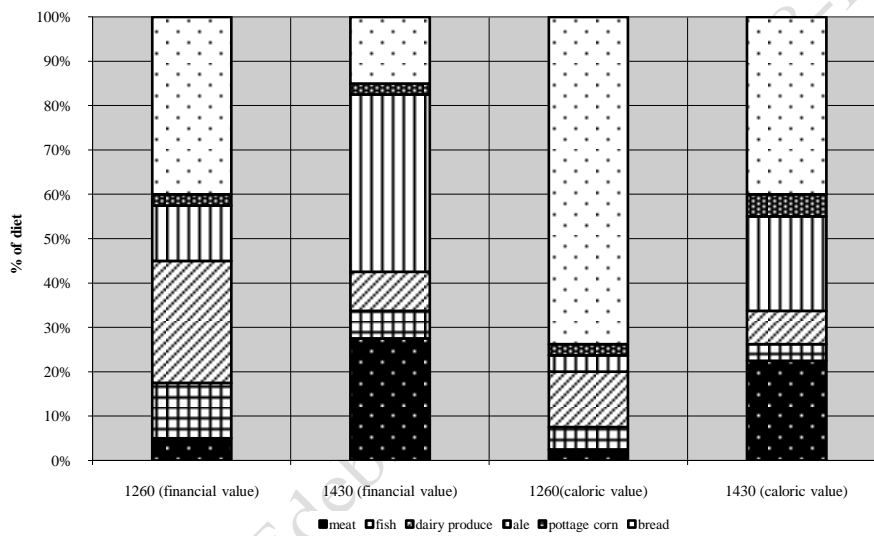
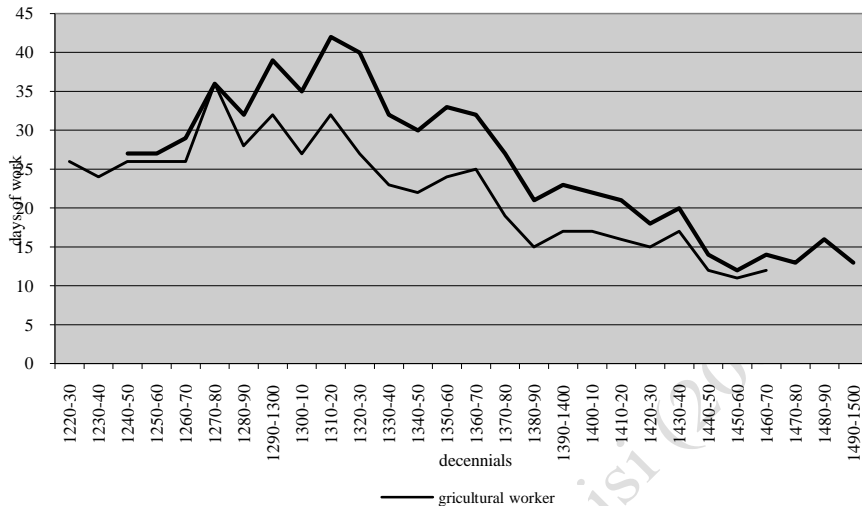


Chart 5 serves as an illustration of the increase in real value of people's income. It shows changes in the number of days that a laborer had to work monthly to cater to his family consumption needs by purchasing a hypothetical "basket of goods".

Chart 5. Index of real wages. Number of working units necessary to buy "basket" of hipotetical goods.



Higher income allowed for quantitative changes in people's diet. They started to eat more meat and drink more beer, while the consumption of dairy produce and bread decreased. But there were also some important qualitative changes. In the 13<sup>th</sup> century, for example, if people consumed meat, it was usually salted bacon. In the 15<sup>th</sup> century, they would much more often enjoy bits of fresh beef.

Improvements in people's standards of living resulted, to a large extent, from labor shortage and the transformation of labor market. Potential employers had to compete for laborers, whose number decreased due to plague. In effect, workers became more mobile; they often moved in search of better working conditions, they entered into shorter, several-week contracts instead of less flexible, one-year contracts.

In the country, along with the processes of concentration of land and switching to more profitable crops, there occurred a sharp reduction in the number of holdings. Between 1347 and 1377, the number of peasant holdings in England decreased by about 50 per cent and 1400 villages disappeared altogether. In Stoughton, which has already been mentioned, in 1341 there were 62 holdings whereas by 1477 their number had fallen to 24. Labor shortage contributed also to faster introduction of the system of rents. Demesnes were divided into smaller parts and leased to tenant farmers.

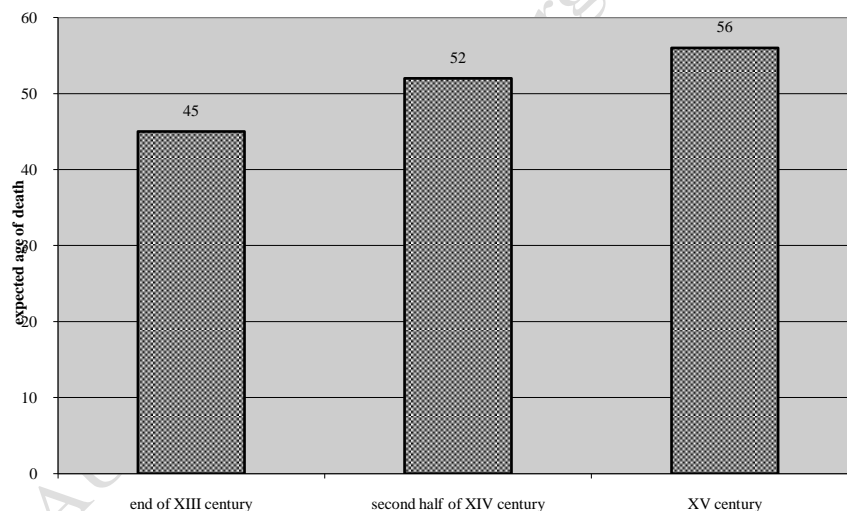
Growing importance of animal husbandry necessitated an extension of cowsheds and sheep pens. Sometimes, abandoned houses were adapted for those purposes. Peasant houses also began to change for the better. More affluent peasants



could afford larger houses which featured separate rooms (kitchen and bedrooms) instead of just one big chamber.

Effects of successive epidemics were visible also in more personal spheres of life. Although average life expectancy decreased, life expectancy at the age of 20 increased, which is illustrated by Chart 6. The fact that people over the age of 20 had better chances to survive might have resulted from their more balanced diet rich in animal proteins, better standards of living, or from the selective nature of epidemics. The age of marriage tended to fall. Before plague, young people postponed the decision to get married until they achieved financial independence, which was difficult because of excessive labor supply. In the 15<sup>th</sup> century, changes in the labor market allowed for earlier marriages. An average age at the time of marriage for men had fallen from 28 to 23 and for women from 23 to 20. Unqualified workers who enjoyed rise in the real value of their wages started to spend more on clothes, which stimulated the production of lower quality woolen cloth and led to changes in the market dominated heretofore by the production of textiles of superior quality.

Chart 6. Medieval peasants' life expectancy at age 20 years.



Better living standards did not seem to encourage people to have more children. Between the second half of the 14<sup>th</sup> and the end of the 15<sup>th</sup> centuries an average number of children per family, regardless of their status, was two. It might have been the result of several recurrences of the epidemic, whose victims were mostly children. On the other hand, however, parents might have, consciously, decreased their procreation so that the children they already had were given more care and were more likely to survive.

Another point is that the rising income of laborers in the second half of the 14<sup>th</sup> and in the 15<sup>th</sup> centuries did not help them to secure higher social status. The reason for that was probably that even though between 1340 and 1500 purchasing power of laborers increased by 100 per cent, their standards of living improved and working time shortened, laborers did not develop a positive approach to saving money. But maybe expecting of a medieval day-laborer to be able to make long-term financial plans is too much.

From the macroeconomic perspective, the Black Death and other late medieval epidemics reinforced a tendency, which had been displayed before, of world economies towards crisis or transformation. In 14<sup>th</sup>-century Egypt, plague only helped to reveal the mounting crisis in agriculture caused by inefficient maintenance of the system of irrigation. The result was a long-term decline in profitability of agriculture. In northern Italy, the Netherlands and England, the Black Death accelerated transformation. All these countries developed into new centers of economic activity, where the focus was on mass production of relatively cheap clothes. New centers competed with the old ones producing luxurious textiles. At the same time, the popularity of putting-out system increased and many producers moved from town to the country in search of cheaper labor. High costs of labor were also the reason for the more widespread introduction of various new technologies aimed at replacing humans in the process of production. Most of these improvements had been already known, but they began to be used on a larger scale. Watermills and windmills were used more extensively in metal and textile production; and wheelbarrows were more frequently used in building. Another innovation that found its way to textile production due to demographic changes caused by the Black Death was a spinning wheel which replaced hand spinning in the production of yarn. All these technological developments were aimed at reducing the costs of labor and increasing productivity even if it was at the cost of quality (as in the case of a spinning wheel).

Concluding, the epidemics of the second half of the 14<sup>th</sup> and of the 15<sup>th</sup> centuries turned out one of the most important factors accelerating the process of social and economic change in Europe. On the one hand, paradoxically, taking into account an extremely high death rate among the poor, the standards of living of the lowest strata of the society improved. On the other hand, as a result of temporary decrease in the demand for food combined with an increase in wages, European economy was forced to modernize. Consequently, late medieval plagues contributed to the introduction of various technical innovations in craft and new organization in agriculture.

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