

**The Medieval Machine:  
The Industrial Revolution of the Middle Ages**

**Jean Gimpel**

Pimlico 1992 [1976]

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A book review by [Danny Yee](http://dannyreviews.com/) © 1993 <http://dannyreviews.com/>

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Economic history has a reputation for extreme dryness, and probably conjures up visions of statistical compilations in most people's minds. On the other hand works on the history of technology are few and far between. Gimpel's *The Medieval Machine* is an unusual mixture of the two, being an extremely readable work aimed at a popular audience. It presents a potpourri of information about the technological successes and achievements of the Middle Ages, and should do much to correct the still stereotypical view of the Middle Ages as backward, superstition-ridden and technologically primitive. The basic thesis is that in the two centuries from around 1050 Western Europe went through a kind of industrial revolution that was as significant as that of the nineteenth century. (The evidence Gimpel presents is drawn largely from France and England, but Italy and Germany and to a lesser extent other countries also get a mention.) This is fitted into a thesis of wider scope, which I discuss at the end of this review.

The first three chapters deal with medieval "primary industry", with energy sources, agriculture and mining. The first chapter describes the crucial importance to the economy of different sources of energy: river, wind and tidal. Their most important use was in mills for grinding corn, but they were also used to drive machinery for many other purposes, including fulling cloth and pressing olives. The role of the Cistercian monasteries and the social factors leading to a more general acceptance of machines than in classical times are discussed. An interesting snippet is a brief history of the world's first joint stock company — a French mill owners organisation formed in the late 14th Century that survived until nationalised after World War II!

The next chapter looks at the agricultural revolution. The introduction of

the modern harness (making horses more effective than oxen in plowing and pulling loads), the three year fallow system, the heavy wheeled plough and other innovations contributed to a large increase in food production. The effects of this on the diet and living standards of people were considerable, with records showing that students at a Paris school had diets that are almost impeccable when subjected to modern nutritional analysis. Another effect was a large population increase throughout the period. Gimpel is also concerned to demonstrate that medieval agriculture was to a large extent "scientific", with treatises on the subject being extremely popular.

Stone quarrying and iron were the most important mining industries in medieval Europe, but tin, lead and of course silver and gold were also very important. Again the Cistercian monasteries played a critical role. German miners attained a particular reputation for excellence and moved throughout Europe (this is reflected in the large proportion of words of German origin in mining vocabulary). The importance of mining was reflected in the prevalence of Crown rights over mineral wealth throughout much of Europe.

The next two chapters deal with the broader social aspects of medieval technology: one on environmental issues and one on working conditions in medieval industries. I was intrigued to discover that pollution and resulting concern about the quality of the environment are not modern phenomena — England had national anti-pollution laws as early as 1388! Working conditions differed drastically between industries: miners and mining communities were granted exceptional privileges while workers in the textile industry were under the tight control of financial and commercial interests, with working conditions foreshadowing those of the later industrial revolution. Working conditions in the building industry were better in the medieval period than in the seventeenth and eighteenth centuries, and strikes were not uncommon. Then there are chapters on two more specific aspects of medieval technology: one on the role of the great architect-engineers (focusing on Villard de Honnecourt) and their construction of the cathedrals that were the pinnacle of medieval achievement, and one on the development of the clock. The final chapter looks at medieval science and its relationship with medieval technology.

Here Gimpel is concerned to point out that Leonardo and the other Renaissance humanists drew many of their ideas from earlier writers, who have got a bad press from history.

The general effect of all this is pretty convincing, but due to the selective and anecdotal nature of the account it is hard to tell what bias there may have been in the selection of facts. So I am a little wary about basing any generalisations on the content. However a more "objective" and statistically rigorous approach would certainly have detracted from the book's readability, so I can't really complain about this.

The last chapter is particularly controversial, as it is here Gimpel goes further and argues that the medieval "industrial revolution" was followed by a setback in the progress of technology. It is worrying that much of the evidence he presents in the other chapters for the forward-looking and progressive nature of medieval technology in fact dates to within the period he wants to describe as an "era of decay" (this can be seen by internal analysis — Gimpel isn't falsifying the evidence). It is also unclear how much bias there may have been in the selective use of statistical materials. The book contains many graphs showing wages, prices, and such-like varying in a fashion consistent with Gimpel's thesis, but perhaps there are others that could have been included that would have supported an alternative view.

If the final chapter is controversial, the meta-narrative (contained in the preface and the chapter-length epilogue) is even more adventurous (one might even say wildly speculative). Gimpel's central idea is that the modern United States is going through a similar cycle to medieval France and is now in process of decay. In so far as this is based on a theory of history as driven by two fundamental underlying properties of society (namely "technological evolution" and "psychological drive") and in so far as specific dates are given as the changeover points between phases, this seems massively oversimplistic to me. Some parts of the comparison, however, are quite interesting, and the bulk of the book can be read and appreciated even if one disagrees completely with the more general theory.

At any rate, while *The Medieval Machine* did manage to make me rethink

my conception of medieval Europe, the most impressive thing about it was how much fun it was to read. I can heartily recommend it to anyone interested either in medieval history or in the history of technology, but it is the sort of book that will also be enjoyed by people who have no interest in either. As well as being clearly written, it is nicely illustrated with black and white photographs and makes good use of line drawings and graphs.

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