

Industrial Revolution: The Case of the Cornish Pumping Engine.*

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Abstract

T. S. Ashton told that one of his students once defined the industrial revolution as “a wave of new gadgets that swept over England”. However crude, this definition is still held to capture a good deal of historical truth. The industrial revolution, among other things, was a major technological discontinuity. This technological discontinuity manifested itself in a number of critical inventions. The history of these inventions is often told in terms of individual creative leaps of imagination in the technological domain combined with the creation of successful entrepreneurial undertakings. Thus, recent historical research still portrays the early phase of the industrialization process in Britain as an “heroic age” of individual inventors (see Mokyr, 1994). What remains to be explained then, is why England was such a fertile soil for individual inventors compared with other European countries.

In this paper, we argue that together with individual inventors and firms, what Robert Allen (1983) has termed as *collective invention settings* (that is settings in which rival firms freely release each other pertinent technical information and in which each firm incrementally improved on a basic common technological layout), was also an important source of innovation in the industrial revolution period. Until now, this has been very little considered in the literature. This paper focuses on one of these cases: the Cornish mining district. In Cornwall, during the early nineteenth century, a notable collective invention setting, gradually emerged. This case is particularly remarkable because it was capable of generating a continuous and sustained flow of improvements in steam pumping technology which in the end greatly contributed to improve the thermodynamic efficiency of the steam engine (see Von Tunzelmann, 1978). In this paper we study in detail the specific economic circumstances that led to the formation of this collective invention setting and we analyse its consequences for the rate of technological innovation.

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