Industrial Revolution in England and France: Some Thoughts on the Question, "Why was England First?" ¹

By N. F. R. CRAFTS

A major concern of economic historians since World War II has been to interpret the process of industrialization in now developed countries. One prominent line of approach has been to compare the experience of the European economies in the eighteenth century, and much of the inquiry has been conceptualized along the following lines. "The Industrial Revolution poses two problems: (1) Why did this first breakthrough to a modern industrial system take place in Western Europe? and (2) Why, within this European experience, did change occur when and where it did?" ²

This comparative approach has been seen as a particularly valuable way of yielding insights into the process of economic growth in general and the causes of the English Industrial Revolution in particular. Thus Crouzet argues that "The economic historian interested in the key problem of growth is bound to find the comparative approach particularly fruitful. A systematic comparison of the eighteenth-century English economy with that of another country—and France as the leading continental power at that time seems the obvious choice—should bring out more clearly what factors were peculiar to England and might have determined what is a unique phenomenon, the English Industrial Revolution of the eighteenth century." ³ Since Crouzet wrote, much of the literature has accepted the usefulness of the question, "Why was England first?" and the specific question, "Why did England experience the onset of the Industrial Revolution before France?" has been promoted to a position of great prominence. ⁴

There is by now an extensive literature offering a wide variety of responses to these questions. The answers seem to fall into three types. First, there are studies which single out a single crucial reason. To cite just a couple of examples we find views as diverse as those of Kemp ("if one overriding reason can be given for the slower transformation of the continent ... it must be the continued prevalence of the traditional agrarian structures") ⁵ and Hagen ("the differences in personality rather than differential circumstances are the central explanation of Britain's

¹ The author would like to thank Robert Harris, Mark Harrison, Peter Law, Ned Lorenz, Robert Moeller, Stephen Peck, and Gavin Wright for their helpful comments on an earlier version of this paper. They bear no responsibility for errors.
⁵ Kemp, op. cit. p. 8.
primacy . . . the Industrial Revolution occurred first in England and Wales . . . because British people were inwardly different from those of the continent").

In reaction against the single factor explanation two positions have commonly been adopted. One is to regard the English Industrial Revolution as the result of a previous period of general economic growth; thus Hartwell argues: “Do we need an explanation of the industrial revolution? Could it not be the culmination of a most unspectacular process, the consequence of a long period of slow economic growth? . . . Cannot the industrial revolution be explained more plausibly as the outcome of a process of balanced growth?” The other is to list a large number of favourable factors, as, for example, does Kranzberg: “In short, there was no single factor which can account for Britain’s leadership in the Industrial Revolution. Instead, it was a multiplicity of factors—technological, social, economic, political, and cultural—which came together in the mid-eighteenth century to provide the stimulus for industrial advance. In all these factors, Britain had a slight advantage over France. But the advantage was qualitative rather than quantitative.”

None of these attempted solutions to the question of why England and not France has been very satisfactory and in their recent book Milward and Saul attacked them all. They argued that “attempts to isolate single factors which can explain the fact that the first industrial revolution occurred where it did . . . tend to break down before the enormous diversity of the continental economies. The more their history in the eighteenth century is considered, the greater appears the difficulty of finding one single factor in the British economy not present in some continental economies.” They also pointed out that “most recent research into the French economy in the eighteenth century has demonstrated that the increase in industrial output per head in the eighteenth century was probably faster than that in Britain . . . [so that] this general explanation no longer seems valid.” They also maintained that the laundry-list approach typified by Kranzberg is “too tautological to be of much value”. Milward and Saul went on to suggest a new direction for search for a solution to the puzzling question of England’s primacy and contended that “Previous centuries of development determined that the industrial revolution happened not in Europe’s wealthiest, most populous, most powerful and most productive country, France, but in an island off its shores.”

This article presents a critical reaction to the recent literature on the comparative economic history of England and France in the eighteenth century. In doing so it accepts Milward and Saul’s criticisms of the existing attempts to explain England’s primacy in experiencing the onset of the Industrial Revolution. However, the position taken below is that the question, “Why was England first?” is misconceived and should be discarded rather than new solutions being

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5 Ibid. 31, 33.
6 Ibid. 38.
sought. In particular, it is argued that the question, "Why was England first?" should be distinguished from the separate question, "Why did the Industrial Revolution occur in the eighteenth century?" and that the failure to do so may have been an important obstacle to an adequate interpretation of the economic history of France in the eighteenth century.

The underlying view of industrialization adopted here is that economic development in general and technological progress in particular in eighteenth-century Europe should be regarded as stochastic processes. The main stages of the argument are as follows. In section II a definition of "industrial revolution," in terms of decisive innovations is adopted as appropriate to the comparison of eighteenth-century England and France. In section III it is maintained that whether a deterministic or a stochastic view of history is adopted the standard question, "Why was England first?" is unanswerable. In section IV a brief review of theories of innovations is presented to suggest that a consensus in favour of viewing innovation as a stochastic process has developed in the literature on technological progress and that accepting this view implies that, although England had the decisive innovations first, ex ante it may have been either more or less likely than France to do so. In section V this proposition is used to suggest that the French economy of the eighteenth century has been unfairly and prematurely written off as inferior to the English.

II

To aid our examination of the problems involved in explaining England's primacy, the question will be put in the more specific form found in the literature, "Why did the onset of the Industrial Revolution occur in England not in France?" "Industrial Revolution" will be understood as a period of accelerated structural change in the economy, involving a rapid rise in industrial output, in the share of manufacturing in national product, and in factory-based activity (implying a different kind of economy), based on major technological innovations.

The focus of our attention will be on the transformation of the already existing industrial sector of the economy, not on the overall growth of the economy or the process of primitive accumulation. It will be assumed that in the mid-eighteenth century France and England were both growing economies with significant amounts of small-scale manufacturing activity. Then for our purposes we can follow the lead given by Landes in giving the cotton textiles industry the leading role in precipitating the Industrial Revolution. Landes does so because it met the following specifications: "On the one hand, industrial revolution required machines which not only replaced hand labour but compelled the concentration of production in factories—in other words, machines whose appetite for energy was too large for domestic sources of power and whose mechanical superiority was sufficient to break down the resistance of the older forms of hand production. On the other hand, it required a big industry producing a commodity of wide and elastic demand, such that (1) the mechanisation of any one of its processes of manufacture would create serious strains in the others, and (2) the impact of improvements in this industry would be felt throughout the economy."1

1 Landes, op. cit. p. 81.
The standard question can then be reformulated in the terms adopted by Davis: "The Industrial Revolution had its immediate beginning in the cotton industry... The events that were decisive were two in number; the invention of the spinning jenny by Hargreaves, and of the water frame by Arkwright... why... did the decisive inventions take place in England?" 1

It is as well to make explicit the counterfactual envisaged in this question, namely that if the "decisive innovations" had occurred in France rather than England, France would have had the first industrial revolution. It should be noted now, however, that this formulation does not regard "industrial revolution" and the achievement of "modern economic growth" as synonymous, nor is it inconsistent with the view that, the first Industrial Revolution having occurred, France followed a different route to industrialization, an "unobtrusive" one. 2

III

There are two important problems which can be perceived in the current attempts to explain England's primacy: the danger of perpetrating post hoc ergo propter hoc fallacies and the failure to assess the relative magnitudes of the impacts of the putative causal factors. In other words there is a need to take into account the ceteris paribus and to estimate the partial effects of the supposed independent variables.

This suggests one of two approaches. First, we might seek to invoke a universally applicable "covering law" of the type "whenever, and only if, A then B", i.e. A is a set of conditions necessary and sufficient for B. Rostow's stage-theory approach can be thought of as a (bold but unsuccessful) attempt to proceed in this way by making such a "lawlike statement". 3 However, solving the problem of the causes of the first Industrial Revolution in this way is impossible since it was a unique event and the outcome of an uncontrolled experiment. The second method would be to make inductive generalizations by looking for empirical associations between various features of economic life and the timing of the "decisive innovations". This would be rather similar to Kuznets' methodology in his examination of modern economic growth. A natural way to proceed would be to run a multiple regression, \( Y = a + \beta_1 X_1 \ldots + \beta_n X_n + \epsilon \), where \( Y \), the dependent variable, would be the timing of the "decisive innovations", the \( X \)'s the proposed "causal factors", and \( \epsilon \) represents an error term. This methodology would be less ambitious than the former, being concerned with sufficiency, i.e. with attempting to say what changes in conditions in France would have sufficed, ceteris paribus, to give France the first industrial revolution. Obviously, this approach is also impossible because we have only one observation. Even if we were prepared to include the imitative follower cases of the nineteenth century we could still expect insuperable problems of interpretation, multicollinearity, and insufficient degrees of freedom. 4

1 Davis, op. cit. pp. 311–13 (original word order slightly amended, but sense same).
2 This term is due to K. E. Berrill, "Historical Experience: The Problem of Economic "Take-Off"", in idem, Economic Development with Reference to South East Asia (New York, 1965).
4 It is noticeable that Kuznets has been able to come up with remarkably little in the way of powerful generalization about the timing of the onset of modern economic growth as is witnessed by the very brief remarks at the end of his Economic Growth of Nations (Cambridge, Mass. 1971).
However, it is helpful to formulate the problem in this way. First, it serves to remind us that some of the $\beta$s (the partial derivatives) could be negative; it could be that some of the features of the English economy cited as favourable to industrialization were actually retardative. Second it draws attention to the error term; its presence implies that for given values of the $X$s there are probability distributions of values of $Y$. With only one observation, this precludes the use of the result that England was first to infer the favourability of particular conditions of the English economy.

There are two different ways of looking at the error term, based on two quite different philosophical positions with regard to the notion of “chance”. One is to attribute it to the difficulty of accounting for a complex event, essentially as an expression of ignorance in a situation where there exists a deterministic relationship between the factors $X_1 \ldots X_n$ plus a further unspecified group of factors $X_{n+1} \ldots X_r$ and $Y$, which in principle would be knowable but in practice is not. A version of this position appears to be held generally by economic historians. That is to say they believe that the observed result that England had the “decisive innovations” and enjoyed the first Industrial Revolution justifies the contention that the English economy was superior to the others in Europe, including the French even though at present they are unsure exactly how. This would seem to be the position of Milward and Saul, for instance, who are among the sternest critics of existing attempts to explain England’s primacy. Unfortunately, this contention that the result demonstrates the superiority easily leads to “explanations of Britain’s primacy . . . [which] consist mainly of a not very convincing sort of ‘retrospective inference’ (‘something must have caused Britain’s primacy in time, so presumably the earlier conditions overtly observable did’).” In other words, the favourability of certain conditions in England has been inferred from the result with the likelihood of post hoc ergo propter hoc fallacies.

A different interpretation of the error term is to argue that the relationships between the independent variables and the dependent variable were genuinely stochastic in the sense that randomness rather than ignorance is involved and that the independent variables are related to the dependent variable probabilistically in the true structure. This would imply that even with all the relevant explanatory variables, $X_1 \ldots X_q$ present in the regression there would still be an error term, representing the “irreducible random”. This view seems to have no supporters at all in the recent debate over the causes of the Industrial Revolution. As Davis, one of the few to have contemplated such a view, remarks, “It could be argued that no explanation is needed. The events that were decisive were two in number; the invention of the spinning jenny by Hargreaves, and of the water frame by Arkwright. . . . These two isolated events may have been fortuitous; the chance of personalities and their good fortune in seeking along the right lines. But the economic historian instinctively recoils from such explanations.”

Perhaps this is partly because at first sight the idea of randomness has connotations of “lottery” and the abandonment of the idea that there were any causal relationships, i.e. in terms of the regression model this would mean that all the $\beta$s were zero and there would be only “noise”. This, of course, is not implied by making the second interpretation of the error term. All that need be maintained

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is that there are probability distributions of values of $Y$ for given values of any $X$ and that the probability distributions of $Y$ are different for different values of $X$. That is to say that the $\beta$ coefficients would be non-zero and could be interpreted as giving information about the partial effect of an independent variable on the expected waiting time to the “decisive innovations”.

So this second view would maintain that it may be, but need not be, that England was superior to France in terms of the probability of achieving the “decisive innovations” in the eighteenth century; i.e. that the result does not reveal the ex ante probability of England’s winning the race, but is merely one of a distribution which we can conceptualise but never observe. An analogy would perhaps be to ask if Walsall’s 2–0 defeat of Arsenal in their 1932 F.A. Cup tie would justify the inference that Walsall was the better team in the sense that they would have emerged victorious a majority of times in a large sample of games.

To summarize section III, then, we conclude that there are no “covering laws” which explain England’s primacy; the best we can do is to formulate explanatory generalizations with an error term. Given that the “event” is unique, the tools of statistical inference are inadequate to explain the timing of decisive innovations. Thus it can be fairly claimed that the standard question is unanswerable.

Furthermore, if the Industrial Revolution is thought of as the result of a stochastic process, the question, “Why was England first?” is misconceived: the observed result need not imply the superiority of antecedent conditions in England. However, a different question, “Why did the Industrial Revolution begin in the eighteenth century?” may, within the context of the stochastic view, still be useful. It could be argued that the ex ante probability distributions c. 1700 of the “decisive innovations” being made somewhere were such that the cumulative probability of their occurring before 1800, say, was virtually one. Even then the precise timing of those innovations would be of no very great significance.

To clarify these arguments and to gain some idea of their possible relevance the next section looks at theories of inventive activity and innovation in the eighteenth century.

IV

There is, of course, a wide range of hypotheses purporting to explain inventive activity. The “great man” or “heroic” approach holds that “The novelties that constitute the basis of social growth and development are [to be] attributed to the inspiration of genius... Such avenues to truth and social change do not admit of explanation or analysis.”¹ “Social determinist” views see invention, and particularly innovation, as an inevitable result of necessity with “the individual... merely an instrument or expression of cosmic forces”.² More modestly, there are hypotheses which see innovation and/or invention as induced by the economic environment via the profit motive. A third “response to stimuli” school of thought tends to accept the importance of economic stimuli but stresses the role of factors which affect the ability of economies to react to incentives, such as sociological influences on the quality of entrepreneurship.

All three of these positions have been assumed as the basis of explanations for

² Ibid. p. 61.
England's primacy, although the "heroic" view has recently fallen out of favour.¹ There are several reasons but among the most powerful are the demonstration by Merton and others² of a large number of multiples in scientific discovery generally and the simplicity of the particular "decisive innovations". The result has been a widespread abandonment of the notion that particular individuals are necessary to particular inventions.

Economic inducements are strongly represented by the hypothesis that the "decisive innovations" were the result of the greater pressure of the growth of demand and "factor scarcities" in England than on the Continent.³ Other authors have emphasized instead a superior ability to respond to stimuli; for example, Rostow argues that "What distinguished Britain from the rest as the eighteenth century wore on was the scale of the inventive effort that went into the breaking of crucial technical bottlenecks."⁴ Other contributors to the view that the Industrial Revolution was based on a vigorous response are represented by writers such as McClelland,⁵ who stress sociological factors, or those like Musson and Robinson, who emphasize the role of science.⁶

However, if the socio-economic theories are regarded as deterministic and examined as to their ability to cope with all the events in eighteenth-century innovation, they appear to be far from satisfactory. Musson has recently mounted a strong critique from this perspective. He suggests that such theories "completely [ignore] the realities of individual achievement, sustained effort, and the mixture of motives involved",⁷ and continues with reference to a number of eighteenth-century improvements. "If these inventions were simply products of pressing economic and social forces," he writes, "why was there such a long time lag before their widespread application? Surely, if they were sociologically or economically 'determined', 'inevitable' and 'necessary', they should have been brought into widespread use immediately?"⁸ Similarly, it is hard not to sympathize with the point of the following quotation from Hook: "Writing in 1880, William James banteringly asked Herbert Spencer whether he believed that if William Shakespeare had not been born at Stratford-on-Avon on April 26 1564, the convergence of social and economic forces would have produced him elsewhere; and whether if Shakespeare had died in infancy, another mother in Stratford-on-Avon would have delivered a 'duplicate copy' of him?"⁹

As far as traditional economic theory is concerned it is in fact difficult, using neoclassical assumptions, to derive predictions about the rate of technological progress or even to support the assertions of writers such as Crouzet, Habakkuk, and Landes as to the beneficial effect of the "shortages" experienced by the

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¹ In notable contrast with the writers of an earlier generation, as seen, for example, by reading the account of the agricultural revolution in Lord Ernle, English Farming Past and Present (1961 edn).
⁸ Ibid. pp. 52–3.
British economy in the first half of the eighteenth century. Indeed, an eminent authority in the field has recently summarized his position in terms of “the extreme agnosticism to which one is led on the subject of technological change by recent theorising”.2

However, if we look closely amongst all this apparent chaos in the literature, we find agreement among many recent authors on a fundamental point, namely that technological progress is treated as a stochastic process. Writers as apparently diverse in their views as Musson and Merton can be interpreted as sharing a vision of innovations emerging from a search process which is highly uncertain in terms of both the nature and the timing of its outcome, and which is conditioned as to its intensity and direction by social and economic variables and as to its chances of making particular discoveries by scientific knowledge and existing technology.

Thus we find Musson arguing on the one hand that “There seems little doubt ... innovators or entrepreneurs were certainly very much influenced by economic factors, such as relative factor prices, market possibilities, and profit prospects,”3 and on the other hand that “if one studies at first-hand the detailed contemporary evidence—revealing the prolonged thought, experiments, disappointments, and innumerable practical problems involved in producing an invention, from the first original idea to eventual industrial application, not forgetting also the countless failures and bankruptcies—then a theory of ‘inevitability’ appears ludicrous.”4

The modern version of the “sociological determinist” view in fact is also a probabilistic theory, summarized thus by Merton: “inventions became virtually inevitable as certain kinds of knowledge accumulated in the cultural heritage and as social developments directed the attention of investigators to particular problems.”5 But Merton takes pains to stress that “I do not imply that all discoveries are inevitable in the sense that, come what may, they will be made, at the time and the place, if not by the individuals who in fact made them,”6 and cites evidence of a distribution of lags in discoveries which subsequently turned out to be multiples of Cavendish’s (at the time unpublished) work.7

The common theme is taken up by Rosenberg, for the “response” school of thought, who stresses the uncertainty of response to economic stimuli, “Many important categories of human wants have long gone either unsatisfied or very badly catered for in spite of a well established demand ... a great potential demand existed for improvements in the healing arts generally, but ... progress in medicine had to await the development of the science of bacteriology in the second half of the nineteenth century.”8 Elsewhere he argues that “the developed countries never solve more than a small fraction of the problems which happen to be formulated and actively pursued.”9

This view of technological progress has seldom been reflected in the efforts of

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4 Ibid. p. 49.
5 Merton, op. cit. p. 352.
6 Ibid. p. 369.
7 Ibid. p. 364.
economic model builders. Recently, though, Nelson and Winter have proposed a model which embodies an evolutionary, conditioned search approach similar to that envisaged by the writers cited above and which was successful in "accounting for" twentieth-century U.S. economic growth. They describe the heart of their model as follows: "Technique changes by individual firms are governed, first of all, by a satisficing mechanism. If the firm's rate of return on capital exceeds a target level, the firm retains it with probability one. Otherwise a probabilistic search process generates a possible alternative technique. The probability distribution governing search outcomes is constructed in a manner that reflects the influence of 'closeness' and 'imitation' . . . if the technique turned up by the search process is actually less costly, at the prevailing wage rate, than the one the firm currently uses . . . the firm changes technique." The authors point out that unlike neoclassical theories "there was no production function—only a set of physically possible activities . . . The exploration of the set was treated as an historical incremental process."

While this particular model may not be appropriate, its general view of innovation as the result of stochastic search processes, in which both economic inducements and scientific, supply-side considerations play a part, appears to have several advantages in the context of our historical concern. Such a view of the world, which appears to be implicit in, or at least not inconsistent with, the work of Merton, Musson, Rosenberg, and many others, need not be troubled by a number of the difficulties which have been encountered in the putative explanations of eighteenth-century innovative behaviour. It could accommodate the appearance of inventions which were not used straightaway and also Merton's theme of the "recurrent fact of long delayed discovery". Moreover, unlike the neoclassical models reviewed by David, a response to resource "shortages" reflected in changed relative factor prices would be expected and presents no difficulty since the distinction between factor substitution and innovation is blurred in this vision. However, the supply of search inputs need only be an increasing function of economic inducements, not exclusively related to them. The results in terms of innovative outputs would be generally but by no means always related to economic incentives.

We are in no position to specify such a model and that is not the present purpose. What are important here are not the details of such a model but the implications of viewing economic history in this way, where the path of the economy could be thought of as the evolutionary outcome of a contingent sequence of probabilistic events. Two points in particular seem worth emphasizing in relation to the standard question, "Why was England first?"

First, in the stochastic world which this view of technological progress embraces, an economy with a lower likelihood ex ante of achieving the "decisive innovations", or with features which tended to lessen the chance of achieving them first, may be observed as the winner in a two-country race to achieve the "decisive innovations" that is run just once. Secondly, although at the outset one economy may have a lesser chance of success it is the nature of the process en-

2 Ibid. 902. 3 Merton, op. cit. p. 369. 4 See above, p. 436, n. 1.
visaged that if it is “lucky” early on it could evolve into a position with much the higher chance of subsequent success; for example, making a “decisive innovation” first may vastly raise the probability of subsequent innovations being made.

It is held, then, that there is a strong case for the argument that the “decisive innovations” should be seen as the evolutionary outcome of a stochastic process and hence that the standard question, “Why was England first?” has been misconceived. This position has several important implications.

(i) The fact that Britain was “more advanced” in 1790 and had a much superior likelihood of further progress in the glamour industries of the period than France does not of itself necessarily imply that ex ante (in, say, 1740) Britain had the greater probability of achieving the first Industrial Revolution or that one should feel obliged to seek reasons for Britain’s inevitable primacy going far back into her history. This position is in stark contrast with that normally adopted by the contributors to the debate over why England was first.

(ii) Since from the unique observed result we cannot infer anything about the ex ante probability of England’s beating France to the “decisive innovations”, it is otiose to pose the question, “Why was England first?” with the hope, à la Crouzet, of gaining insights into growth in general.

(iii) Indeed, if one could construct a simulation model of development during the period embodying stochastic technological progress, one would expect to observe from many runs for each economy a distribution of times for the “decisive innovations”. It then seems inappropriate to try to account for the one observable result of history drawn from an unobservable distribution of possible outcomes with a general theory.

V

Two questions immediately arise. First, does this point of view seem absurd in the sense that the British economy was self-evidently superior to the French in, say, the mid-eighteenth century? Secondly, how has the superiority inference been justified?

The answer to the first of these questions would seem to be a resounding “no”. In fact, the theme of similarities between the French and English economies is one which from time to time has found a number of friends. For example, Nef, writing in the 1940’s, argued that “According to the popular misconception... British industrial development was in sharp contrast to Continental throughout the eighteenth century, and not simply at the very end of it. But... the rate of industrial change from about 1735 to 1785 was no more rapid in Great Britain than in France, a far larger country with nearly three times as many people. What is striking... is less the contrasts than the resemblances between Great Britain and the Continent, both in the rate of economic development and in the directions that development was taking.”

A rather similar chord has been struck by Rostow in his recent work. His comment on the figures reproduced here as Table 1 is that “There is... some ambiguity about why Britain and not France was the first nation to move into take-off.”

With regard to French innovative potential, Mathias states unequivocally that "The French record of scientific growth and invention in the eighteenth century was a formidable one." We learn from McCloy that in the first half of the eighteenth century there were more patents granted in France than England, despite a legal situation making it likely that patent statistics understate French relative to English inventiveness. It also becomes clear from a reading of McCloy that the French came very close to pre-empting Hargreaves's invention on at least two occasions in the 1740's and 1750's. In retrospect it would hardly seem a great shock if France had succeeded in view of the simplicity of the "decisive innovations", French inventive ability, and the fact that search was evidently taking place. If so, as Rostow puts it, "the French market, with its absolutely larger urban population, was not so poor as to rule out an ample domestic as well as a foreign market for cheap cotton textiles, if French industry had produced them first."

The answer to the second question is predictable: it is Britain's ultimate primacy that has, erroneously, been held to justify the presumption that something or other about the preceding conditions was superior, although recent authors have had difficulty in pinpointing the area of that superiority. Thus Davis, having found fault with all the standard arguments, concludes, "The safest thing to say, perhaps, is that although the need for innovation was strong in France as in England, French society offered a less congenial climate to innovation than did English." Likewise, Crouzet claims "the explanation for Britain's superior inventiveness ... [is that] the conditions for innovation seem to have been more favourable than in France. ... [There was] a 'critical mass', a piling up of various factors favouring England's growth which triggered off a chain reaction—the Industrial Revolution. In France, on the other hand, there was no such critical mass, which is why France did not spontaneously start an Industrial Revolution."

But these "explanations" bring to mind Gerschenkron's comment on Rostow: "The question was what made growth start. Rostow would answer that it did.

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3 Ibid. pp. 89–93. 4 Rostow, 'The Beginnings', loc. cit. 570. 5 Davis, op. cit. p. 313.
so because the preconditions were completed. When one asked how this was known, the further answer was that growth had started."¹ Not surprisingly in the circumstances we find vigorous disagreement over the validity of the assertions of the superiority of particular key features; for example, O’Brien and Keyder would reject Habakkuk’s claim of faster growth of demand,² Davis rejects Crouzet’s diagnosis of labour shortages,³ and Kemp dismisses Landes’s claim of greater technical skill and ingenuity.⁴

An alternative has been to take information from the late eighteenth- and early nineteenth-century progress of the French economy to suggest that the French were less innovative and slower to adopt new methods.⁵ Yet this, too, is far from convincing. First, it can be argued that many innovations then made in England should be thought of as consequences of the "decisive innovations". Second, French development took place under the handicaps of an English lead and wartime disruption and does not therefore reveal reliable information concerning the ex ante potential of the French economy. In any case, the determinants of diffusion are not necessarily the same as those of initial development, particularly where international diffusion is concerned.

So, as with the a priori arguments of the preceding section, this discussion leaves us with strong grounds for resisting any automatic inference of British ex ante superiority. It is interesting, therefore, to note that some writers have recently begun to criticize what they see as an unjustified condemnation of the French economy of the eighteenth century and have argued for a major re-interpretation of French economic performance.⁶ It is the contention of the following paragraphs that the literature of which they complain is, at least partly, an outcome of the misconceived use of the standard question, "Why was England first?"

It seems possible to reconstruct one powerful current in the literature as follows. During the retreat from the cataclysmic/exogenous view of the Industrial Revolution,⁷ economic historians correctly perceived the need to examine the long-run build-up of conditions in the economy which could have promoted the Industrial Revolution. Ashton, for example, reacted against the earlier "cataclysmic" history and stressed the importance of the long view.⁸

An extension of this argument was the crucial, but misguided, step that, if the first Industrial Revolution was a distinctive feature of the English experience and itself related to prior trends in the economy, then the previous experience of the economy in England must have been more favourable. This also assumed, particularly in the absence of quantitative work, that the course of development up to that point had been much different. This led, on the one hand, to the presumption of English superiority and French inferiority, and, on the other, to attempts

³ Davis, op. cit. p. 312; Crouzet, loc cit. p. 168.
⁴ Kemp, op. cit. p. 17; Landes, op. cit. p. 61.
⁵ For example, Landes, op. cit. p. 63.
⁷ See M. W. Flinn, Origins of the Industrial Revolution (1967), ch. 1, for this expression and a discussion of the relevant historiography.
to identify, by comparison with other economies, favourable features of the English economy. This stage is well reflected in Habakkuk’s work.\(^1\) At this level of comparison, the “inferiority” of the French economy was regarded as established by virtue of England’s primacy and non-English features of the French economy were asserted to be retardative of the Industrial Revolution. This process of thought is instanced in Kemp’s recent book.\(^2\)

The stochastic view of technological progress advocated in this article does not permit this kind of reasoning and suggests a different approach. An appropriate question to have asked, when it was perceived that the long view was important in understanding English developments, would have been, “Were there factors which made the probability of the onset of the Industrial Revolution high in eighteenth-century England?” rather than asking, “What made France inferior?” the comparative economic historians’ translation of “Why was England first?”

When the question is put in the new, rather than the standard, form, and when the achievements of the French economy in the eighteenth century are taken into account, it no longer seems obvious that taking the long view should imply seeking reasons for French inferiority. Indeed one might also ask, “Were there factors which made the probability of an industrial revolution high in eighteenth-century France?” and would not presume the probability was necessarily higher in England just because England was first. The adoption of a stochastic view of the development of the two economies naturally leads to the separation of the two questions, “Why was the Industrial Revolution likely in the eighteenth century?” and “Why was it likely in England?” Looking at things this way would surely have mitigated against both the “unfair” treatment of France in the literature about which O’Brien and Keyder and Roehl complain, and also the *post hoc ergo propter hoc* fallacies which permeate so much of the literature.

VI

It remains to make a couple of disclaimers. First it is not argued that the Industrial Revolution in England was an entirely fortuitous event. Secondly, it is not argued that the French economy was more likely than the English to have an industrial revolution in the eighteenth century, but simply that the English economy, or particular features of it, has not been proved to be superior in that regard.

Essentially, the argument warns against expecting too much from comparative economic history. Whilst Landes argues that “if history is the laboratory of the social sciences, the economic evolution of Europe should provide the data for some rewarding experiments,”\(^3\) it is unfortunately the case that some of the uncontrolled experiments that history performed were unique, non-repeatable events.

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\(^1\) Habakkuk, loc. cit. *passim.* \(^2\) Kemp, op. cit. ch. 1. \(^3\) Landes, op. cit. p. 39.