

Managerial Inefficiency and the British Climacteric, 1860-1914

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June 1994

ABSTRACT

This paper argues that the primary cause of Britain's economic decline was the culturally-rooted unwillingness of British entrepreneurs to decentralize decision-making within their firms. Many observed characteristics of British industry can then be explained, most importantly the lesser ability of large British firms to generate innovations and maintain growth in all aspects of the firm. Thus we see vigorous entrepreneurship early in the life of many industries, but as the industries mature and larger firms become appropriate and are developed in the US and Germany, British firms lose their ability to compete.

The long debate on the causes of Britain's climacteric has shifted its focus to Britain's institutions, particularly the management structures and techniques employed by British firms. This paper contends that the behavior and performance of British firms depended not only on the management and market structures employed, but also on the management style and underlying attitudes of British entrepreneurs. The key elements of this typical management style, its impact on industrial development, and its possible roots in British business culture and the class system, will receive extensive attention.

The discussion in the literature of Britain's economic decline in the Victorian and Edwardian eras has proceeded on two levels: through analysis of the aggregate data on output and productivity for the economy as a whole, and through industry studies and firm histories to determine whether British industry had kept up with best practice. The aggregate data have usually been used to date when the decline began, while the causes of the decline are now primarily sought through industry studies and analysis of disaggregated data. Our main concern here is with understanding the causes of Britain's economic difficulties, but we first briefly examine the problem of dating the decline.

The Debate on Dating the Beginning of Britain's Climacteric

There has been much discussion of whether there was in fact economic decline before 1914, mostly relying on the national income statistics that are available. In the 1970s McCloskey challenged the view that there was a decline before 1900, and there has been a lengthy debate on whether the slowdown in the growth rates of output, total factor productivity and labor productivity first appeared in the Victorian period, the Edwardian period, or later. Whether or not there was a break in the growth rates for the 1890s or 1900s depends on which measure of "success" is relied upon (output, TFP or labor productivity), and what kind of corrections are made to the data.¹

Many economic historians have argued that examination of industry studies shows that British industries failed to keep up technologically and organizationally with the foreign competition.² Yet some historians, especially Pollard, have responded that the loss of technological leadership by some industries was compensated by gains in other industries in the period before 1914, particularly in consumer goods, finance and services, such that the emphasis on the losers is misplaced. They also argue that relative economic decline of the first industrial

country before 1914 should be reinterpreted as an inevitable catching up of the follower countries.³

Given the long relative decline that Britain suffered from, with real GDP per capita rising at an annual rate of only 1.4% in the period 1870-1989, compared to a rise in the US of 1.8%, in Germany of 2.0%, and in France of 1.8%, it would appear indisputable that the British economy had some long-term problems. By 1989 at least 11 other countries had passed Britain in GDP per capita, with the US level 36% higher than that of Britain. While in 1870 British labor productivity was 4% higher than that of the US, by 1938 it was 36% lower.⁴ The increasing number of studies showing loss of international competitiveness in various industries further strengthens the conclusion that something was wrong with the British economy.

The debates on dating the decline and determining its causes are usually conducted separately. But if the thesis of this paper is correct they are interlinked and must be considered together -- the causes of the decline affect whether and when we can observe a sharp decline in rates of growth of British productivity. In particular, we will find that although most British industries at some point in their history did go into decline, the critical moment when this decline began varied from industry to industry. Thus the British economy suffered from a gradual accumulation of failed or weakened industries, causing a slow, unsteady relative decline in growth and productivity.

We can thus see the reason for the difficulties in interpreting the aggregate data. Just as in the two-sector growth models proposed for understanding the industrial revolution, we have here a growing number of sectors that were falling behind in terms of productivity and growth, some of which due to their linkages to other sectors (especially in the process of electrification of industry) held back productivity growth (relative to the other leading countries) for the rest of the

economy.⁵ These failing sectors gradually slowed the rate of productivity growth of the British economy, or conversely the successful American and German sectors accelerated growth of their respective economies. Whether or not aggregate growth actually slowed in Britain before 1900 is then of little significance, because the seeds of decline were already implanted, and there would be a gradual cascade of failing (or slower growing) industries that would increasingly hold back the British economy over the course of the twentieth century.

Past Explanations of Economic Decline

The literature on Britain's economic decline is large, and many theories have been proposed to explain the decline of the world's first industrial nation. Two points should be kept in mind while considering the usefulness and validity of these theories. First, analysis of any industry's or sector's development must be made in comparison with developments in other countries, especially in the US and Germany. Only through comparative analysis can we discover the relevant factors that caused British industry's difficulties. It can also make clear which of the barriers to change and growth that British firms allegedly faced were truly insurmountable, as opposed to those barriers which foreign firms found ways to circumvent. In any case, Britain's economy can be said to have declined only in comparison to the strong growth shown by its leading competitors, particularly since it has remained a member of the industrial world, with the high incomes associated, as McCloskey has recently emphasized.⁶ Second, this paper assumes that there was a common factor or related set of factors that caused British economic decline. It is highly unlikely that so many British industries suffered difficulties for reasons unique to their industry, that is, that Britain just got unlucky. Thus we are looking for explanations that apply to many industries.

Three types of explanations have emerged on the causes of British economic decline. The

first type argues that British businessmen were guilty of conservative and risk-averse behavior that hindered the development of their firms, i.e., that "entrepreneurial initiative and drive were flagging" and there was "entrepreneurial failure." British businessmen are accused of being complacent, amateurish in their methods of doing research, and overcommitted to old ways and production techniques. The persistence of family firms in Britain, noted by many historians, is alleged to have had an impact on the behavior of older entrepreneurs and their heirs, on the management structures adopted, and on the likelihood that talented and educated outsiders could move up to top management within the firm.⁷ British culture and educational institutions are said to have spread the wrong attitudes to businesses, including class consciousness and an "anti-industrial spirit."⁸

While on the surface appearing to explain British business behavior, particularly large firms' failure to adopt new technologies, this type of explanation is generally based on assumptions that are not confirmed by the evidence. Most British businesses, and even the supposed "anti-industrial" upper classes, never lost their appetite for more profits.⁹ Firms that were challenged by declining sales and profits often desperately sought to find ways to survive, despite their evidently conservative behavior. While in some countries business conservatism may have been due to lack of interest in profits and growth, this was not so much the case in Britain. We should not confuse the conservative actions of firms with conservative attitudes by entrepreneurs.

The second type of theory argues that some exogenous factor or external constraint, such as different resource endowments, biased or inefficient capital markets, the size of the domestic market, the inadequacies of the educational system, or government legislation, weakened British industry enough to cause it to fall behind.¹⁰ British businessmen were therefore not to blame for

their difficulties. For instance, McCloskey and others have attempted to show that British entrepreneurs were acting rationally in not adopting the latest technology, due to different factor prices.¹¹ Yet there were too many industries that fell behind best foreign practice to believe that British industry just got unlucky in its resource endowment. Meanwhile, many industry studies have provided evidence of British firms failing to seize opportunities that were available to them, and were seized by their foreign competitors. Some of the alleged institutional failings, such as the weak educational system, were in fact largely the result of lack of business support.¹² The supposed problems of the capital markets have been argued by many to not have been as serious as has been suggested.¹³

Recently a third set of explanations has been developed, which hold that British industry adopted economic institutions that later proved inadequate for maintaining competitiveness and growth. Criticism of British economic institutions has focussed on either the corporate structures used by firms, or the entrenched market structures and labor relations of British industry. In the first area Chandler has argued that the implementation of high-throughput production techniques was delayed because British firms were slow to adopt the new corporate structures that American firms were experimenting with, such as the centralized functionally-departmentalized form and the multidivisional form. In his book Scale and Scope Chandler has blamed Britain's "entrepreneurial failure" on "the failure to make the three-pronged investment in production, distribution, and management essential to exploit economies of scale and scope."¹⁴ While American industry was becoming more "managerial" (meaning manager-run), British firms remained in the control of entrepreneurs and their families. British firms inadequately utilized middle managers, failed to employ integrated management structures to control all aspects of the firm, and were less diversified than their foreign counterparts. Gourvish pointed out the

complete lack of use of organizational charts before 1914, and observed: "By the turn of the century, a 'corporate lag' was becoming evident, in the sense of a slowness to adopt large-scale corporate organisations in comparison with the faster rate of change in the United States. ... Business organisation was essentially simple, as far as one can see, based upon a few functionally-structured departments. Policy and planning roles and, in many cases, routine decision-making too, were left to dominant personalities."¹⁵

In contrast to Chandler's emphasis on the inadequate corporate structures utilized, in Elbaum and Lazonick's influential work The Decline of the British Economy the New Institutional school has argued that British industry adopted a set of market institutions that at one time gave a competitive advantage in cost and quality to British firms, but later proved to be a hindrance to growth.¹⁶ British industry became locked into a set of institutions and expectations that no single firm or individual could change. For some industries, such as the cotton textile industry, the key institutions were the market structures used to link together small, efficient, highly specialized "atomistic" firms. These market structures were highly developed, yielding large external economies giving British industry an early competitive advantage. When new methods of production were developed abroad, requiring large vertically-integrated organizational structures, British firms found it too difficult to make the switch, because of the heavy investment in market structures already employed.¹⁷ For other industries, such as the auto industry, they argued that it was management-labor relations that hindered the adoption of new technologies. Thus once the system of payment schemes, labor negotiations structures, and worker expectations was set up, which was suited to the early technological and organizational methods in use in the nineteenth century, it became too difficult for any single firm to attempt to adopt the newer methods in use elsewhere, without either raising fears from workers that the firm

was trying to take advantage of them, resulting in labor relations strife, or increasing its costs too much in the short-run and risking bankruptcy.¹⁸

While this institutional explanation provides a powerful insight into how inadequate institutional structures prevented British industry from keeping up with its foreign competition, both Chandler and the New Institutionalists fail to explain adequately the source of the difficulties preventing British industry from adopting the new management and market structures that were needed. Elbaum and Lazonick rely on a path dependency argument -- once British industry entered one path, there were barriers to changing paths (which prevented moving to a new equilibrium). Yet there is strong reason to doubt the size of these barriers preventing a change in structure, particularly since in many instances American and German industries were able to transform their own structure when necessary, and overcome these same barriers.¹⁹

Chandler attributes firms' resistance to change to the class system, the lack of aggressiveness by British entrepreneurs and the lingering of the family firm.²⁰ But he puts too much emphasis on the structure used, and not enough on how its performance depends on the behavior and expectations of entrepreneurs and managers. Rather than argue that the British mistakenly did not implement the optimal structures, this paper suggests British businessmen generally (but not always) implemented the best organizational structures for their circumstances, given the managerial style they had been taught and the business culture they worked in. Thus British industry stuck with the old management techniques partly because they preferred them and the methods had worked well in the past, but mostly because the new organizational structures, which others were employing so effectively, proved to be far less effective when the British tried them.

Why Britain Declined

The center of attention of the literature on Britain's decline has shifted, as we have seen, to the problems of British firms' structure and management. Chandler, the New Institutionalists, and others have identified many important types of institutional failures that have hindered industrial development. Yet while each of these factors explains the immediate cause of industrial difficulties, this paper argues that they are themselves symptoms of the fundamental inefficiency of British management structures, particularly evident at times when larger organizations were being developed abroad.

The failure of British firms to develop efficient hierarchical bureaucratic structures prevented them from taking advantage of much of the internal economies of scale and scope that a number of foreign competitors were developing. As firms became larger and more complex, and industries and technologies matured, maintaining a firm's competitiveness became dependent on developing an organization suitable to the task, with the appropriate distribution and use of information. Decentralization of decision-making became increasingly important in both improving existing complex and high-tech technologies through formal R&D programs, and in keeping the firm abreast of its competition in many organizationally-critical areas, through "balanced growth" in many fields such as marketing, sales, production planning and control, and finance. Thus for many industries that reached maturity, when American and German firms were finding that functionally-decentralized decision-making was crucial to their prospects for further development, British firms' corporate structures and management techniques proved inadequate for maintaining growth and competitiveness, even if these firms had previously been successful. Oftentimes we can identify that critical moment when British firms began to fall behind their foreign competitors, which occurred when the pace of change and the complexity of the industry

overwhelmed the ability of the smaller and less organizationally-sophisticated British firms to keep up.

No other general explanation fits the varied situations of a broad range of industries. But the explanations provided so far, that British structures were inadequate for maintaining growth, do not go far enough. We need a deeper theory that can explain the poor organization and performance of large British firms, and the lack of interest they showed in the new management structures being developed abroad. It should also be compatible with, and for the most part explain, the typical characteristics of British industrial development for the period 1860 to 1914, as noted by many historians.²¹ These characteristics or "stylized facts" include: the tendency in many industries of British firms to remain small while foreign firms were growing; the difficulties in arranging mergers; the failure to rationalize mergers; the apparently conservative behavior of large British firms; the lack of formal R&D programs in British firms; the low numbers of people hired by firms with formal technical and business educations; the lack of technical, vocational, and business programs offered by Britain's educational system; the loss of control of the shopfloor to the unions by management; the reliance on skilled workers by manufacturing firms to maintain their competitive edge; the failure to develop balanced growth, with continual progress and improvements achieved simultaneously in many areas of the firm; and the tendency to autocratic rule by business leaders of their firms.

This paper argues that the most important source of British organizational failure was the culturally-rooted attitudes and management style brought to the firm by British entrepreneurs. The system of management the British preferred to use within the firm was a rigid hierarchical structure with subordinates trained to follow orders and take no initiative. Bureaucracies in British firms were constructed to carry out the orders of top management, while many American

and German firms were attempting to also distribute information and decision-making throughout their organizations. Cooperation was poor between groups of different backgrounds and training, such as the accountants and the engineers, who jockeyed for power within the firm despite the need to work together and pool their complementary talents. British entrepreneurs recruited for top management people of the same background and class, and technical training was often discouraged. In Britain aggressive entrepreneurship was expected only from a firm's leaders. Those subordinates who demonstrated talent and initiative generally found it necessary to leave and start their own firm if they wanted to achieve recognition and success. The end result was an economic system where larger firms were run autocratically by their leaders, who often lacked technical training, cooperation between different groups was poor, and entrepreneurial initiative by talented subordinates was channeled into new small firms, instead of being harnessed by larger firms. The British seemed unable to create the same sort of "organizational man" as was being employed in American and German firms.

A succinct way of describing the British managerial style, whose economic consequences can be explored more clearly, is to say that British entrepreneurs delegated less authority to their managers than did their American and German counterparts. The reluctance to delegate authority limited decentralized decision-making, and hence reduced the efficiency of hierarchical bureaucratic structures. British entrepreneurs reserved the authority for making important decisions to themselves because of the influence of British business traditions and cultural values, combined with the lack of theoretical understanding that existed then (and even today) about the importance of delegating authority. As will be seen, this failure to decentralize decision-making prevented larger British firms from making in a timely manner the changes needed to keep pace with foreign firms, and was a major influence in the development of British

industrial and market structures. The new corporate structures developed in the US and Germany were slow to be adopted in Britain because their advantages derived from pushing much of the decision-making down to lower levels of the firm.

An explanation for the typical characteristics or stylized facts of British industry listed above can be at least partially found in the failure to delegate authority. For example, the inadequate utilization of specialists hindered progress in crucial areas of the firm, especially in R&D, which slowed firms' growth. Most significantly, because firms did not rely on their middle and lower managers, who were needed to handle the lower level details, it was more difficult to rationalize or reorganize the massive mergers undertaken in the 1880s and 1890s. The weakness of firms at the middle management level also forced the top management of many firms to allow unions and skilled workers to take care of problems arising on the shopfloor, including arranging apprenticeship programs to train replacements, such that the surrender of control of the shopfloor was not as much a political defeat as an economic necessity.

The rest of this paper provides further clarification and support for the thesis that inadequate delegation of authority was widespread in the British economy, and had a profound impact on British economic development and growth. In the next section a framework is developed to provide a theoretical understanding of the concept of delegating authority. In the following two sections we show how inadequate decentralization of decision-making explains the key features of British industrial development in general, and of some important industries, especially chemicals and electrical engineering. Subsequent sections present additional evidence that British entrepreneurs did in fact delegate less authority than their American and German counterparts, and finally some hypotheses are provided suggesting why they felt it necessary or desirable to do so.

The Economic Theory of Delegating Authority

To understand the concept of delegating authority as used in this paper it is necessary to examine how information is distributed and utilized within the firm, particularly in larger firms. The framework used for analysis here employs two key assumptions which differ from the usual neoclassical premises: (1) The time available to an entrepreneur for processing information and making decisions is limited; (2) Information is unequally distributed to individuals, differing in terms of location, experience, training, and education. These concepts are related to the theory of boundedly rational individuals developed by Herbert Simon, which studies the problems of uncertainty, incomplete information and the difficulties for human beings in processing complex information.²² In this perspective British entrepreneurs, no matter how hard-working and knowledgeable they were, found their capabilities limited by the amount of time they had to act and the information they had available and were able to process.

At some point in an industry's development entrepreneurs need to extend their ability to handle problems by delegating authority to others, in effect loosening their time and information constraints. Much of an organization engages in routine tasks such as production, shipping, accounting, purchasing, and sales. Most of these tasks are well-defined and require only simple decision-rules, where a decision-rule is a previously defined action to be taken in response to a predictable situation (such as, if you observe X, always do Y). In most large organizations, especially in bureaucracies, few "risky" decisions need to be made requiring human judgment to determine new responses to unforeseen circumstances. We will assume that a firm consists of a set of decision-rules which subordinates follow, which is called its organization capital, while the entrepreneur makes decisions on how to change these decision-rules to help the firm grow or adapt to the changing market place. This description of the firm is similar to Nelson and Winter's

view of the firm as composed of routines and skills.²³ Through Schumpeter's process of creative destruction a firm's set of decision-rules can become obsolete as other firms innovate in various areas such as product quality and features, sales and distribution techniques, production methods, how the good is marketed at home and abroad, methods of financing the firm, and the accounting system used.²⁴ Growth of the firm, or even its ability to keep pace with the competition and maintain sales, will often depend on improving the firm's procedures, as well as allowing subordinates with information they are privy to ("impacted information") the ability to act on their own.

Delegating authority is defined as granting authority to change the firm's decision-rules, and to respond to situations for which no decision-rules exist, without requiring guidance from the top executive or entrepreneur. By allowing this authority to his subordinates (referred to here as "managers," since in larger firms authority is usually delegated to those who manage others), who might have special training and access to information, the entrepreneur can increase the firm's ability to respond to changing circumstances and improve the firm's set of decision rules, which would otherwise be limited by his own time and training. This is especially important for larger firms, which are involved in selling many kinds of products in widespread geographic markets and have large numbers of employees and decision-rules. In certain fields by their very nature there are few fixed decision-rules and most decisions are risky -- for example research and development, which is often an exploration of the unknown.

However, there are dangers to delegating authority. If the manager is not as capable at handling the job, due to inadequate training or lesser intelligence, or if a high degree of coordination is needed between different functions of the firm, requiring information only the entrepreneur has, then the manager may make costly mistakes which the entrepreneur could have

avoided. And the preferences of the subordinate may differ from those of the entrepreneur, leading to opportunistic behavior at the entrepreneur's expense. If the entrepreneur fears managerial mistakes or opportunism, then he will respond by centralizing all decision-making and limiting the authority of his managers. If the entrepreneur hires managers, he will restrict them to obeying orders, and following preexisting routines and rules which limit their discretion. Thus the existence of a large bureaucracy and organization does not necessarily mean authority is being delegated.

A simple framework (derived from team theory) may be used to provide a theoretical perspective on the problem of when decision-making should be decentralized.²⁵ The firm is composed of an entrepreneur at the top, with n managers as his subordinates, each assigned to a different activity within the firm. To maximize output the appropriate action $a \in A$ must be taken in response to the current state of the world $x \in X$. The payoff function, representing the profits from action a and state x , is represented by $\omega(x,a)$.²⁶ The critical assumptions here are that each manager has perfect information about the state of the world x , but is uncertain about $\omega(x,a)$, so the result of any action a is only imperfectly known. The perceived payoff function, which is what the manager thinks $\omega(x,a)$ looks like, we will call (x,a) . We also assume that the manager's goal is to choose a to maximize $\omega(x,a)$, to maximize the firm's profits, such that his preferences are perfectly aligned to that of the entrepreneur.

The entrepreneur wants to achieve the highest $\omega(x,a)$ possible. He lacks knowledge of the state of the world x , which the manager knows. We will assume he has two choices: either allow the manager to choose action $a \in A$, or constrain the manager's action to just a^c , with no authority delegated.²⁷ Given that with delegated authority the manager will choose $a^* = \text{argmax}(x,a)$, where (x,a) is the manager's perceived payoff function, the issue for the entrepreneur is whether

$E[\omega(x, a^*)] > E[\omega(x, a^c)]$. If so, then he should delegate authority, since the manager's likely choice when free to choose will yield a higher payoff to the firm than will his action when constrained to obey either previously defined decision-rules or orders from the entrepreneur. Clearly the manager has imperfect information about the true payoff function, and has very limited means of running tests to determine its global maximum. If he has superior information, we will assume the entrepreneur is unable to impart more than a limited amount of it in his message to the manager; a "command" then transmits a minimum amount of information without educating the manager as to the logic behind the decision.²⁸

Since a^c comes from either the entrepreneur, or from the standard operating procedures of the firm, in a crude sense the question of delegating authority revolves around whether the entrepreneur's understanding (or the firm's standard procedures) yields a "more accurate" $\omega(x, a)$ than the manager's understanding about $\omega(x, a)$. If a is a simple one-dimensional parameter, and the manager can easily run tests on $\omega(x, a)$, then the manager should be able to do better when granted freedom of action. But there are many reasons why a manager (or any subordinate working on a problem) might have a poorer knowledge of the payoff function than the entrepreneur. Random guessing and limited experimentation may yield poor information about $\omega(x, a)$ if, for example, the set of actions A is large, so that the likelihood of finding a better action a than other experts have done is small; or if there are nonlinearities involved and a small error in the choice of a may lead to large losses in the payoff function; or if situations arising and actions taken elsewhere in the firm have a large impact on the shape of $\omega(x, a)$; or finally if the manager making changes is able to observe only the output of an intermediate process, and not its eventual consequences (such as whether the final product does perform better for the customer).

According to some theories of learning, the shape of the payoff function plays a critical part in

determining the ability of agents to learn and improve their performance if only limited experimentation is possible.²⁹ It has been shown that in some circumstances even with more extensive experimentation, if the experimentation is costly and yields only a little information, there is a finite probability that the wrong conclusion will be reached, yielding the "Rothschild Effect" of learning theory.³⁰ The complexity of the world, and the amount of information needed to become an expert on the payoff function, will also be important in determining the ability of the manager in choosing the right actions.

It seems likely that delegation of authority will increase (i.e., the set of actions a^c permitted by the entrepreneur will be larger) when: the task is relatively simple and easy to figure out; it is hard to predict the circumstances in which the manager may find himself in, making it difficult to develop decision-rules in advance; local "impacted" information about the state of the world is important, and is immediately available in detail only to the local manager; the manager has better background knowledge about the particular activity, relative to the entrepreneur; the manager has a high ability in terms of scientific and practical training and innate talent; for his decision-making the manager does not need "complementary" information from other departments that the manager may not be involved in, but the entrepreneur is coordinating; the firm is very large, and thus the entrepreneur has less time to devote to decision-making on each activity; and communication between the entrepreneur and the manager is good, building trust and preventing mistakes.³¹

With respect to the British economy, there are a number of possible reasons why British entrepreneurs might have wanted to delegate less authority than their foreign counterparts. One possibility is that they feared opportunistic behavior by the subordinate. Yet the problem of divergent preferences between entrepreneur and manager, which Holmström has explored and is

the basis of the principal-agent literature, from the historical evidence does not appear to have been any greater in Britain than elsewhere.³² Hence the problem of mistrust caused by the potential for opportunism, as described by principal-agent models, would not apply here.

Alternatively, British entrepreneurs may have believed, perhaps mistakenly, that subordinates lacked the competence to handle the added responsibility. Their perception of their subordinates' abilities might have been colored by class attitudes and by the subordinates' lower status background and education, and communication to build trust may have been hindered by differences in accent and outlook. The mistrust might have been mutual -- despite their public deference, lower classes were wary of classes above them, and might have resisted attempts to impose a common corporate culture, needed to make decentralization of decision-making work.³³

Finally, entrepreneurs may have failed to understand the need for delegating authority because of the strong influence of Britain's business culture, which taught that such delegation was not needed, and because of the lack at that time of an economic theory of its role in business management.

Thus for various reasons British entrepreneurs may have underestimated the value of delegating authority within their firms. The cost of experimentation to determine its true value was high because implementing a system of decentralized decision-making requires hiring educated people, training them extensively, paying them an appropriate wage, and changing their prior attitudes and expectations, as well as setting up an appropriate organizational structure in which information flows to where it is needed and monitoring is routinely done to prevent fraud and major blunders. Since setting up decentralized decision-making requires a large initial investment and much work changing the organization, and since the consequences of such actions are observed mostly in the long-run, entrepreneurs will not attempt to create this type of

organization unless they believe ex ante that there are large ex poste benefits to be gained. In other words, such a system of decentralized decision-making will only be attempted if the entrepreneur is convinced beforehand that the firm will profit from it. If British entrepreneurs were predisposed to believe that delegating authority would not eventually be profitable, because of the prevailing business culture or class attitudes or for whatever reason, they would then not find it desirable to invest in a system of decentralized decision-making.³⁴

Such a set of beliefs, if widely shared, would have serious repercussions for British industrial development. When improvements to the firm's procedures and structures were needed, in changes to sales techniques, marketing, production, equipment employed, worker training, R&D, finance, internal organization, and strategic planning, entrepreneurs would have to make all of the key decisions concerning the changes, despite their limited time and training and access to impacted information, instead of distributing the decision-making around the firm to those best placed to make the "risky" (non-routine) decisions needed. Large British firms would suffer then from a kind of x-inefficiency, to use Leibenstein's term, because of the inefficiency of their organizations in distributing and processing information relative to many large firms in other countries.³⁵

The Impact of Inadequate Delegation of Authority on Industrial Development and Economic Growth

This paper argues that there was indeed a widespread British reluctance to delegate authority, which affected the growth and productivity of many industries. Generally, the failure to decentralize decision-making reduced the efficiency of larger organizations, and hindered their ability to generate new products, particularly those that were technologically complex, and to produce, market and sell them effectively at home and abroad. As larger firms developed abroad,

particularly in fast-moving industries, British industry found itself unable to keep up technologically and organizationally, because of its comparative failure (or slowness) to build large efficient bureaucracies and delegate authority to specialists.³⁶ Not only did this hinder the productivity growth of British firms, but because of a variety of linkages the growth of the rest of the economy was hurt.³⁷

The issue of whether larger firms are more efficient than smaller firms goes beyond the usual notions of scale economies and cost structures, and extends to their ability to innovate technologically and organizationally. This ties into the Schumpeterian hypotheses linking firm size and innovation. But the concern here is for more than just the production of patents -- it extends to a firm's organizational efficiency in simultaneously: marketing its products using appropriate advertising techniques and distribution systems; minimizing its costs through improved production, distribution and accounting methods; creating a complete line of interrelated products; and updating its products to meet the demands of the consumer and match improvements made by competitors.³⁸

Whether larger firms actually have a competitive advantage over small firms depends not just on the efficiency of their bureaucracy, but also on the state of the technology and the maturity of the industry. An industry structure that is appropriate at one time may well prove to be inefficient at another time. Typically, new manufacturing industries began with smaller firms, willing to explore new ideas. Eventually as the problems of production, sales, marketing and R&D became better understood and routinized, larger firms with significant amounts of decentralized decision-making within a functionally-departmentalized organizational structure proved more effective in generating simultaneous gains in cost-reduction, product innovation, marketing and sales. Note that not all large firms required much decentralized decision-making

to maintain their competitiveness, if the environment and technology was fairly stable for most areas of the firm.³⁹

Smaller firms usually need less delegated authority, because entrepreneurs can take a hand in almost all aspects of the firm, and they often show greater flexibility because of their lack of a large bureaucracy.⁴⁰ Britain's system of markets of small, aggressive, entrepreneurial firms was appropriate at stages of development (such as in the first industrial revolution) when R&D was less routinized, the development of complete product lines and a large internal organization was not needed, and balanced organizational development was of less importance. At these times small firms, supported by well developed markets, wealthy formal and informal capital markets, and a skilled and adaptable workforce, helped to develop a highly sophisticated market system, creating large external economies of scale which gave British industry at least temporarily significant advantages over its foreign competition.⁴¹ Many industries composed of smaller firms generated innovations through "collective invention," as Robert Allen called it, where interactions between competing entrepreneurs in the industry, and their sharing of information about technical improvements, helped to rapidly develop new technologies.⁴² During the nineteenth century British entrepreneurship was able to produce bursts of growth in many industries, such as in the cotton textile industry, the early heavy chemical industry (in LeBlanc and sulphuric acid production), and the early synthetic dye industry.

Yet as many industries matured, and the complexity of their operations grew, the need for larger firms increased. Historically most industries reached a stage in which small organizationally-simple firms could no longer produce innovations and reach out to potential customers as effectively as larger firms with specialists handling problems in many areas. This would occur after the industry's goals and basic technologies had become well defined and

understood, so that a large organization could assign tasks to its members with minimal risk of their accomplishing nothing, or worse, damaging the production or sales of existing products. In some industries this occurred quite early in the industry's life, while other industries did not reach this stage for a hundred years. British industry typically depended on its external economies, vigorous entrepreneurship and highly trained labor force to maintain its competitive advantages. At some point in the development of most industries, this proved inadequate. At this time, when American and German firms found ways either through internal growth or large-scale mergers to create the larger firms needed to stay competitive, and utilized sophisticated corporate structures in which authority was delegated to middle and lower managers, British firms either remained small, or if they managed to grow to larger size, failed to utilize the level of decentralized decision-making which was needed.⁴³

The failure to delegate much authority by British entrepreneurs both hindered the creation of larger firms, and slowed the growth of those larger firms that did appear. Mergers proved difficult to arrange in Britain, with competing interests insisting on getting their say, as Tolliday noted in the steel industry. Many businessmen did not want to give up their autonomy partly because of the British preference for owning one's own firm, but it seems likely that they also feared that if they worked for someone else, they would be delegated no authority. Thus Charles Parsons, S.Z. de Ferranti, and William Perkin, all brilliant researchers, showed no interest in merging with other firms, or relinquishing control of their own firm to professional managers while they specialized in R&D. Even large industry-wide mergers, that were arranged to monopolize an industry, tended to remain loose federations, with each pre-merger firm remaining an autonomous unit and getting its say in the management, such as occurred in United Alkali.⁴⁴

Those British mergers that were accomplished were not rationalized or reorganized into a

centralized functionally departmentalized structure, unlike in the US and Germany where such organization usually followed mergers. Because it involves a complete reorganization of a firm and many of its decision-rules, rationalization requires middle managers to handle all of the details; for a large merger the entrepreneurs would have difficulty arranging everything themselves. After a large British merger the original firms were often allowed to continue as quasi-independent units. William Lever of Lever Brothers found this to be the best way to manage the empire he had built, since he was not willing to invest in a large organizational apparatus.⁴⁵

Meanwhile larger British firms appeared to be suffering from "entrepreneurial failure," with slower internal growth and less diversification of their product lines in comparison with their foreign competitors. The cause of this slowdown in growth for most of the larger firms was their inability to utilize decentralized decision-making to maintain "balanced growth," in which improvements in the firm's organizational capital are simultaneously made in multiple areas of the firm. The new organizational structures utilized in the US and Germany were slow to be employed in Britain because they were less useful there, given the lack of authority delegated by entrepreneurs. Thus firms behaved conservatively not because they were risk-averse, but because their leaders lacked the right organizational tools to aggressively search for and implement new technologies. Continued growth increasingly depended on a large bureaucracy with authority delegated to lower levels. Formal R&D in particular was hindered by the lack of authority delegated to researchers.

Abroad new systems of bureaucratic management, which delegated authority to highly educated and trained managers, were being developed. The electrical industry provides some good examples. The dominant American firms, General Electric and Westinghouse, built up

large organizations to handle the many tasks they faced, and to provide information for the top people when they needed it. In the 1890s General Electric had vice presidents in charge of sales, finance, and manufacturing, as well as a legal counsel. Four committees were set up to handle various problems, with a Board of Directors to provide some direction from stockholders and to monitor the firm's progress and finances, an Executive Committee of the Board of Directors to examine company operations on a closer basis, and Sales and Manufacturing Committees to discuss problems and policies. The three factories had a large amount of autonomy, due to the degree of standardization employed and thus the low level of risk involved. Statistical reports sent in kept headquarters informed on the work done. Sales activities, on the other hand, were closely monitored, with discounts for larger sales having to be approved. This was due to the changing circumstances of local and national business conditions, and the sensitive negotiations which might be required for large purchases, which top executives could better handle.⁴⁶

An important point which GE appeared to understand well was that for decentralized decision-making to work effectively, the bounds to the authority that is delegated must be carefully delineated, to prevent subordinates from making mistakes due to inadequate information and poor coordination of actions. Subordinates who are potential decentralized decision-makers must be carefully chosen, trained in the fields they will work in, and given a broader view of the firm so that they understand the big picture. Procedures need to be put into place so that the potential for fraud is reduced, the new managers have the information and incentives they need to perform optimally, and decisions they make are properly coordinated with other parts of the firm. Because of their tendency towards centralized decision-making, British firms failed to implement many of these procedures, especially extensive management training programs that were common in the US.⁴⁷

British firms often failed to achieve growth or make improvements in more than one area of the firm. The improvements made depended on the field of expertise of the entrepreneurs in charge, whether it was research, sales, accounting, finance, or marketing. If that field was critical to the success of the firm, and if the structures already set up in the firm or outside it in the marketplace were adequate, growth could be spectacular despite weak entrepreneurship in complementary areas of the firm. For example, William Lever came to dominate the soap market because of his ability at advertising, even though his product (whose technology he had purchased) was somewhat inferior to that of his competitor Crosfields. Yet Lever's autocratic ways, in which he monitored and controlled every piece of his huge empire personally without properly integrating them or developing a large administrative apparatus, created serious problems for the firm later in his life. As Lever Brothers grew, he found he could not keep up with all of the changes taking place in the world market.⁴⁸

As firms grew in size, and the complexity of products increased, technological development was limited by the resistance of entrepreneurs to delegating authority to researchers. Product development would often cease if the entrepreneurs themselves were not technically oriented and undertaking their own researches. There was virtually no investment in formal R&D programs by British firms before 1914, and even in the 1930s through 1950s, the intensity of R&D levels in British manufacturing firms has been described as about one-third the level of that in the US, in terms of R&D expenditures per sales and employment of researchers per wage earner.⁴⁹ This failure to invest in large R&D programs prevented the discovery and development of more complicated technologies, such as nitrogen fixation processes. As a result product diversification was rare for British firms, and was often achieved more by accident than on purpose. For example, both Kenrick's in hardware manufacture and Courtauld's in crepe

production moved into new areas without a purposeful plan.⁵⁰

The managerial inefficiency (relative to the American use of decentralized decision-making) of larger British firms thus caused them to fall behind their foreign competitors in technology and organization. It also allowed smaller domestic competitors to catch up more quickly. On the lists of the largest 100 and largest 200 firms in the British and American economies, there was a greater turnover of British firms than American firms during the interwar period. Between 1919 and 1930, 31 of the leading 100 British firms dropped out of the 1919 list for reasons other than merger, while between 1930 and 1948, 24 dropped out of the 1930 list. Rates of stability comparable to that achieved by the US in the 1920s were not attained until the 1950s and 1960s. This lack of stability reflects the inability of larger firms to efficiently utilize their resources to maintain growth, suggesting that managerial diseconomies of scale were more significant in Britain than in the US.⁵¹

Impact of Poor Decentralization of Decision-making on Particular Industries

The failure to delegate authority is most easily observable in two of the new "high-tech" industries that are considered central to the second industrial revolution, the chemical and electrical engineering industries. In both of these industries British entrepreneurs were involved in early developments, sometimes in the forefront, sometimes close behind American and German leadership. Yet despite early successes, the British fell behind their foreign competition. Focussing on these industries allows us to see that it was British management techniques that were to blame, since market institutions, labor difficulties and resource constraints were not important factors as they might have been for other industries. However, we will also see that many other industries could be argued to have suffered from the weakness of British management structures.

Chemical Industry

In the chemical industry, the British were successful so long as sophisticated organizations were not needed, particularly in the fields of LeBlanc soda production, fertilizers, and soaps. In most sectors of the chemical industry British entrepreneurship established an early lead, and usually at some point the British industry could be considered the world leader. But the German and American chemical industries passed Britain by, such that in 1913 the UK produced only 11% of world output of chemicals, compared with Germany's 24% and the US's 34%. Most observers agree that by WWI Britain had fallen behind in most sectors of the chemical industry, including dyestuffs, pharmaceuticals, photographic chemicals, Baker's Yeast, sulphuric acid, fertilizers, nitrogen fixation processes, explosives, alkalis, and the electrolytic production of bleaches.⁵² Lindert and Trace have argued that there were missed opportunities for British firms, particularly in the production of alkalis, where Brunner Mond enjoyed a virtual monopoly in using the ammonia soda process long after Solvay's patents had expired. They determined that the resistance of United Alkali, a firm created by the merger of all the Leblanc producers, against switching to the ammonia soda process clearly cost it large potential profits, providing strong evidence of "entrepreneurial failure."⁵³

While a few sectors of the chemical industry declined because of resource and market constraints, most had problems because of British firms' preference for remaining organizationally small. Once large corporate organizations with decentralized decision-making and large formal R&D programs were needed, American and German firms passed British firms both technologically and organizationally. This critical moment when large organizations took over from small firms came late in the heavy chemical (alkalis, bleaches and sulphuric acid) fields, but arrived relatively early in the histories of the light or organic chemical (dyestuffs,

photographic chemicals and pharmaceuticals) industries as well as in nitrogen fixation, because of their more scientific nature. The few large firms that did develop in Britain, such as Brunner, Mond, Nobel's Explosives, and Courtaulds, did so on the basis of control of some key patents and technologies. Despite their early successes, they were generally unsuccessful in diversifying their product lines, remaining satisfied to defend their existing product lines, except in times of desperate need. Even the best run firms in the chemical industry, Nobel's Explosives and its successor Imperial Chemical Industries, lacked a large research program and the advanced management structures that their top foreign competitors had, and ICI had serious difficulties in the 1930s due to the autocratic control of its chairman, Harry McGowan.⁵⁴

The sudden loss of leadership is most striking in synthetic dyestuff production, a field which the British invented and developed in the early 1860s, and for which they had the supplies of raw materials (coal-tar from the gas industry) and demand for the final products (textile producers). August Hofmann, the great dyestuff researcher, wrote at the London International Exhibition of 1862, that England would "beyond a question, at no distant day become ... the greatest colour-producing country in the world ... Bold as these anticipations may at present appear, precedents exist in abundance for their justification."⁵⁵ But circa 1870, when a new class of dyes based on alizarin and the azo dyes was discovered, which could best be exploited with large research staffs, the large German firms began their rise and British firms, which chose to remain small and grossly underpaid the few chemists they hired, lost their leadership. The German firms came to completely dominate the industry, with huge organizations utilizing large numbers of chemists for research and to oversee production, and with large sales staffs trained to sell dyes in every part of the world. By 1913 German firms produced 85% of world output of dyestuffs, twenty five times that of Britain's puny industry.⁵⁶

Electrical Engineering Industry

The electrical manufacturing industry is another example of the failure to keep pace organizationally with the foreign competition. By 1900 the manufacture of electrical equipment in Britain was dominated by foreign concerns, with 59% of sales of electrical machinery in Britain in 1907-8 being produced by subsidiaries of foreign firms. The British electrical industry was by this time considered fairly backward, producing few innovations after 1900.⁵⁷

It has been pointed out that the British electrical industry did not lack entrepreneurs in the 1880s and 1890s, nor an interested market or capitalists willing to invest large amounts of money in new ventures.⁵⁸ Yet in the critical years around 1890, when industry structures in the US and Germany were being transformed, and large American and German firms were being created, such as General Electric, Westinghouse, AEG and Siemens, in order to engage in "systems building" as T.P. Hughes described it, British firms remained small, and British entrepreneurs, despite their brilliance, proved unwilling to expand their organizations and delegate authority. Men like S.Z. de Ferranti in alternating current equipment, Charles Parsons in turbine design, and Joseph Swan, the coinventor of the incandescent light bulb, were acknowledged leaders in their fields, and many others had complementary specialties, such as Hugo Hirst in marketing and sales of equipment, Charles Crompton in producing reliable systems, and Charles Merz in creating large area electrical supply systems. Yet while American and German firms were pooling the talents of many people within the large corporate structures they were building, British entrepreneurs preferred to go it alone. Thus the wave of mergers of electrical firms undertaken in the US was never matched in Britain, and the large firm needed to compete with the rising powers was not created when it was most urgently needed, despite the abundance of talent available.⁵⁹

The career of Sebastian Z. de Ferranti is typical of the kinds of difficulties experienced by British inventors. At one time he worked for the firm Siemens Brothers, but he decided to leave when some investors who were impressed with his ideas told him to start his own company, otherwise "you'll do the inventing and they'll collect the cash."⁶⁰ Later he came up with major innovations in alternators, meters, high-voltage cables, AC distribution systems, switching equipment, transformers, and turbines, but made only small profits off of them partly because he lacked commercial sense (for example, his insistence on delaying the shipment of his new steam alternators in order to add improvements in the late 1890s cost him heavily due to penalties for late delivery, pushing his firm into receivership), but mostly because he did not build a large organization to exploit these new technologies and manage the different functions of his firm. The huge Deptford power supply project, ambitiously designed to light one million lamps in London in 1889 and for which some called him the "British Edison", ended a failure, because he had failed to carefully research (unlike Edison in New York) demand conditions in London, and because he wanted to tackle all of the technical problems himself, which meant endless delays whenever a problem was encountered.⁶¹

Charles Parsons was another remarkable inventor who preferred his independence to working within an organization. He developed the turbine, which had the potential of producing electricity at a cheaper cost than the standard reciprocating steam engines. But he stopped work on this project in order to work on turbines used for steam propulsion, which entailed a new set of problems. Like Ferranti, he failed to profit as much as he should have from his new ideas. He needed a larger organization, but was particularly difficult to work with; it was observed "he was not made to be a member of a team." He tended to lose his temper and fire senior people, such that it was often said at his works at Heaton "the nearer the top, the nearer the gate."⁶²

Both men (and many other British innovators) worked within an environment that encouraged them to go it alone, and provided little pressure for them to build larger organizations. Meanwhile in the US even a man as headstrong as Edison felt obliged to build a larger corporate organization, in emulation of (or perhaps feeling the pressure from) the corporate interests he was working with. While organizations such as General Electric and Westinghouse were initially built on the patents they acquired, their continued success depended on the men they hired, and they knew it. Even independent-minded inventors such as Stanley and Tesla were hired and supported by Westinghouse, and GE aggressively sought out people like Charles P. Steinmetz, who was an electrical systems genius who had even less commercial sense (meaning he did not know how to profitably develop his ideas) than Ferranti. It was only through the cooperative efforts of innovators in many fields, including accountants, salesman and production specialists as well as inventors, that the new technologies of electrical power and light systems could be fully developed and utilized.⁶³

Other Industries

This section provides a brief look at how inadequate delegation of authority affected many other industries. In industries that developed larger firms, such as railroads and the steel industry, British firms failed to develop the efficient management structures being used abroad. While American railroads were pioneering new management techniques and structures, British railroads were slower and less efficient in developing their own organizational structures. As a consequence, by 1914 British railroads had failed to adopt best practice techniques in use in the US, as even their own shareholders noted at the time. Railroad leaders have been described as devoting "far too much time and energy to building up vast railway empires, and as a consequence they neglected the question of efficient operation."⁶⁴ The lack of interest in

controlling the railroad through a well-developed management system, with a professional middle management used to handle the smaller details, is reflected in the poor (almost non-existent) statistical data collected by the railroads, despite their well-known importance to US railroads.⁶⁵

In the steel industry, Elbaum and Tolliday have noted that British firms needed to reorganize, merge and rationalize their operations in order to catch up to best foreign practice. Allen and Erickson pointed out how steel firms tended to be dominated by family members, and were slow to promote people up the hierarchy. The boards of directors were dominated by people who lacked good information about the firm's technology and products. Meanwhile, managers maintained rigid control of their firms, with little delegation of authority.⁶⁶

Many British industries preferred to keep their organizational structures small and simple, relying on extensively-developed markets, low administrative overhead, and a skilled workforce to maintain their competitive advantage. Shipbuilding and the auto industry were examples of industries that lacked the middle managers to control the shopfloor, and depended on their highly skilled workers for maintaining the quality and low cost of their production. In shipbuilding it was not until the 1940s and 1950s, with the appearance of increased scale economies and new technologies, that the British system of small firms, skilled labor forces and weak management structures, proved inadequate for maintaining international competitiveness.⁶⁷ In the auto industry, firms had to rely on complicated schemes to induce greater effort from their highly-skilled labor force in the 1920s and 1930s, to compensate for their reduced control of the shop-floor, as Lewchuk has so ably pointed out. Even Ford's subsidiary in Britain, despite being led by the brilliant entrepreneur Percival Lord Perry, lacked much formal organization, to the horror of the Ford management.⁶⁸

The British preference for keeping firms small and organizationally simple, relying on their highly developed markets to keep them efficiently supplied and to sell their goods, is most evident in the textile industry and the international trade sector. Mass and Lazonick have commented that in the textile industry, "Compared to the more vertically integrated enterprise structures in cotton industries abroad - industries that lacked Lancashire's unique institutions for the buying and selling of raw materials and intermediate products - the Lancashire industry economised on administrative costs. The low cost of internal enterprise organisation in Lancashire was reinforced by the institutions of industrial relations ... that generated a self-disciplined operative labour force requiring relatively little direct supervision." While still a controversial point, it has been alleged that this organizational structure prevented British firms from adopting the latest technologies in the ring-frame and the automatic loom in the period 1880-1914.⁶⁹

In the international trade and investment sector, Wilkins has observed that most of Britain's direct foreign investment was controlled through thousands of small "free-standing" companies, generally set up to be active in one particular commodity and region. Unlike American foreign investment, which was usually organized by American multinational corporations who provided a complete managerial structure and set of skills, these free-standing companies usually lacked much organizational structure and managerial talents. Most of these companies performed poorly in the long-run, and the few companies that were successful had created an internal management structure, usually rudimentary, according to Wilkins. The failure rate was especially high in countries with indigenous management skills, such as Canada and the US, because of the difficulties in competing with well-organized local firms, and the free-standing companies that were successful had usually obtained local management.⁷⁰ Even larger

firms involved in international trade often failed to set up much of an organization. In the oil industry, Shell Oil, despite being one of the major players in the international oil market in the 1890s with a world-wide empire, was run with minimal staff by two brothers out of a small office. In contrast, Standard Oil in the US had built a large bureaucracy to manage its holdings.⁷¹

Evidence that British Entrepreneurs Delegated Less Authority

In general it is difficult to observe the degree to which managers of a firm actually delegate authority, and a proper statistic to measure the amount of authority delegated is virtually impossible even to define, much less observe or calculate. It is only recently that business historians have begun paying attention to the internal structure of British firms, and thus provide some anecdotal and statistical evidence bearing on our thesis. Hence the evidence presented here on the behavior of entrepreneurs and the structure and operation of large hierarchical organizations in Britain is not as complete, direct, and convincing as would be desirable. Perhaps the strongest support for the theory that British firms failed to effectively utilize decentralized decision-making is in its ability to explain the characteristics of British industrial development (documented in the preceding sections). However, the kind of evidence presented there is necessarily indirect, in that we must infer the behavior and attitudes of British businessmen from the behavior and performance of their firms (much as the physicist infers the existence of quarks from the behavior of observable subatomic particles).

There is much evidence, though most of it is not statistical, that British entrepreneurs did not rely on their middle managers. While tales of "Morgan's Men" and of Andrew Carnegie's lieutenants in the US are well-known by historians, we rarely hear of the non-family assistants to major British entrepreneurs, suggesting either that British business historians have ignored them despite their importance, or more likely that they were not important enough to write about.

Carnegie, Henry Ford, George Westinghouse, Thomas Edison, Emil Rathenau, and many other great American and German entrepreneurs, no matter how autocratic they were, depended on their Schwabs and Sorensens to take care of the crucial details. The top management of large American corporations paid much attention to identifying, hiring and training managers, and moving the best ones up the hierarchy. Many major American firms proved quite willing to trust their middle managers, even allowing them the latitude to create the rules needed to govern the bureaucracy.⁷²

Both Lazonick and Keeble have analyzed how British managers were educated, hired, trained and promoted. The strict separation between the top and middle positions that was typical of British firms Lazonick has called bureaucratic segmentation. The top positions were usually reserved for members of the family. One observer noted that the only principle behind the organization of British firms seemed to be "myself, my father, my son, and my wife's sister's nephew."⁷³ Later on, when there were not enough qualified family members, firms looked for people with either good connections or a good generalist (as opposed to technical) education, and they had to have the right qualities or "personality" for leadership.⁷⁴

Meanwhile technically-trained specialists that were hired for lower positions could not expect to move up to the top. Thus Lazonick observes: "the relatively closed ranks at the higher management levels segmented general management from specialists and lower-level line managers (often drawn from the ranks of specialists)." Although in America most of the potential managers, even members of the family, were expected to rise through the ranks after acquiring a specialist education, in Britain they generally entered near the top level of management, maintaining the separation of top and middle management. Zunz notes that in the US the major divide was generally between white collar and blue collar workers, such that lower

and middle managers often associated with top management within the firm.⁷⁵

The statistical evidence that is available supports the argument that a higher proportion of top corporate people in Britain than in America reached their high rank due to family connections or large investments, lacked a technical education, and came in to the firm at the top instead of working their way up. For example, according to one sample about a third of leading British entrepreneurs of the nineteenth and twentieth centuries entered their firm through family connections. Erickson's study of the British steel industry shows that 51% of steel executives in office in 1905-25 came in through connections or investments, and about 25% came in at the top. A study of 725 engineering companies in the 1950s showed that over two-thirds of about 4,000 top executives lacked technical qualifications. Meanwhile American business leaders were more likely to have a technical education, and to have come up through the ranks. Newcomer reports that of leading American executives in all industries, only 6% in 1900, and 14% in 1925, entered through family connections, and less than 10% started at the top.⁷⁶

The poor education and training of British managers has been discussed by Keeble. Even as late as 1985 only 12% of male British managers had university degrees. She argues the true cause of this was not a shortage of educated managers available but instead a lack of appreciation by the firms of their importance. She exonerates the educational system for the poor education of managers, observing that many universities experimented with business and technical education programs, but unlike in the US and Germany, received little support from industry in financial assistance, the hiring of these programs' graduates, and encouragement of employees to continue their education.⁷⁷

Not only did British firms not hire people with a technical or commercial education for managerial positions, but they also lacked adequate management training programs. Even as late

as the 1960s, only a minority (20%) of the larger companies had systematic training programs in place, and less than 1% of all industrial managers had had any training. People were hired to do a specific job, not for their potential to develop into a top manager. Surveys of British managers showed that movement between firms, and even within the firm between departments, was rare. Managers were not expected to get experience outside their own department or function, and so were not given the breadth of "planned experience" needed to make effective decisions on their own.⁷⁸

Some of the most striking evidence of the weakness of British management systems and techniques comes from an analysis of military bureaucracies in World War I. Their method of organization usually reflected that used in large corporate structures in the private sector, being subject to the same cultural influences and biases. The British army was once described by the Germans as "lions led by donkeys," because the bravery and ingenuity of the lower ranks (the "lions") was often wasted by poor decisions by the officers (the "donkeys") at the top. The officer corps proved inadequate in spotting and seizing opportunities, organizing campaigns, and coordinating operations.⁷⁹

Despite its high reputation and importance, the Royal Navy has been similarly criticized. Despite being staffed at all levels by gentlemen, lower officers were not expected to make decisions on their own. According to Barnett, "although the British thought of their navy in terms of 'the Nelson touch' - that is, of adventurous initiative - it was in fact ruled by a discipline more rigid and pointless than that of the Prussian army. This discipline was based on the principle of absolute, unquestioning obedience of, and subordination to, one's superiors." All officers were given detailed instructions by the Admiral, and were expected to obey them to the letter. Meanwhile the German navy, despite its much smaller size and importance, was better

organized, with captains given only general directives, and allowed more freedom of action. This decentralized decision-making did not come easily -- officers had to be trained to operate within this system in such a way that their actions would not expose the fleet to unnecessary dangers.⁸⁰

Possible Roots of British Management Style

British entrepreneurs learned their management methods from both experimentation and from the prevailing business culture. The optimal method of running a firm is a form of technological know-how, acquired by imitating and learning from others, and by interactions with superiors and subordinates. Developing a new system of decentralized decision-making is difficult in any environment. For example, the German dye firm Bayer had many difficulties developing a research laboratory with professional chemists in the 1870s and 1880s, partly because of resistance from the production foremen accustomed to doing their own trial-and-error experimenting, and partly because of the difficulty in determining how to structure such a laboratory.⁸¹ Entrenched attitudes of others (especially potential employees), and value systems adopted as part of the inherited cultural heritage, as well as the difficulties and costs in "experimenting" to develop a new technology of management, mean that well-developed cultural attitudes will often tend to persist.

Our understanding of how culture can affect businessmen's decision-making is very poor, so this discussion is rather speculative. Two possible cultural influences that have been discussed by British social historians were the self-help ethic of individualism and the class system. The notion that the individual could succeed on his own through hard work, and not rely on the work of others, identified by Harold Perkin as the rise of the entrepreneurial ideal, had been reinforced by the success of "self-made men" in the first industrial revolution, and

popularized by writers such as Samuel Smiles in his widely-read book Self-Help.⁸²

Of probably greater importance was the pervasive class system, which reached its zenith in late Victorian society, and was much more highly developed in Britain than in any other industrial country. Class distinctions were maintained in a variety of ways: "Segregation, by income, status, appearance, physical health, speech, education, and opportunity in life, as well as by work and residential area, was the symbolic mark of class society at its highest point of development."⁸³ The multitude of classes, each with its own manners, ideology, accent, life-style, and even religion, made communication, cooperation and trust much more difficult. If entrepreneurs do not trust their subordinates to successfully act in their interest, because their perception of their subordinates' ability is colored by differences in class and accent, then they will not delegate authority. Chandler, Coleman, Lazonick and others have emphasized the influence of both family loyalty and the class system in creating bureaucratic segmentation within firms' hierarchies.⁸⁴

Larger firms were typically made up of many different groups, whose behavior depended on their social and economic status and their training and background. Keeble has argued that within the firm there were both horizontal divisions, such as between layers of management and between management and workers, and vertical divisions between different professional groups, that hindered cooperation.⁸⁵ Thus technical engineers emphasized research to create new products, accountants stressed the problem of containing costs, and salesmen and commercial engineers worried about how to convince the public to buy the product. Communication between the groups was often poor, and which problems the firm focussed on, whether product development, cost cutting, or advertising campaigns, usually depended on the background of the entrepreneur in charge.

This problem within the firm of "compartmentalism" between the professions, as Keeble called it, which is one cause of reduced delegation of authority, was most evident within the electrical equipment industry. Here a number of firms found themselves careening between control by innovators who developed wonderful new products but did not know how to profitably sell them, and control by accountants who made a short-term profit by reorganizing the firm and cutting costs, but then failed to invest in research to develop new products. Each group was blind to the inadequacies of its own approach and abilities, and was unable to communicate with (or even show respect for) groups with complementary expertise.⁸⁶ In his description of electricity supply undertakings in the interwar period, D. A. Wilson describes a force preventing change and growth:

This force was very important, not so much because it deliberately obstructed attempts to sell electricity, but because it epitomized a view of electricity which saw attempts to sell the product as almost irrelevant. This outlook essentially saw the supply of electricity as the prerogative of engineers. Any interference with these rights was bitterly resented and commercially-minded people within the organization were seen as of insignificant importance, or sometimes more specifically as "scum."⁸⁷

Similarly, in the area of electrical equipment manufacturing Keeble observed that "the men's fierce pride in [Metropolitan-Vickers Electrical Co.'s] heavy engineering skills was matched only by their distaste (widespread amongst technical men) for the book-keepers. 'We used to regard accountants as servants and inferiors', confirmed one of them some years later."⁸⁸ Note that when the accountants took charge at other times, they too failed to respect and fully utilize the abilities of the research engineers.

Conclusion

To someone trained in neoclassical economic theory it should be surprising that Britain, the nation with perhaps the freest and best developed markets, most laissez-faire policies, and aggressive entrepreneurship, should suffer from a loss of competitiveness relative to foreign economies. As Leslie Hannah noted, "In the last few decades of the nineteenth century and the first decades of the twentieth Britain was perhaps nearer to the ideal of the free market than any other major country at any stage in history. . . . It was such an 'ideal' neoclassical economy which failed."⁸⁹ Yet as Alfred Chandler and the New Institutionalists have pointed out, free markets and vigorous entrepreneurship were not enough. As industries matured, as R&D became routinized, as economies of scale developed and as national and international markets were created, larger organizational structures were being developed by leading firms in the US and Germany, particularly in the new high-tech and high-throughput industries. These structures were not just large collections of decision-rules, they were also designed to allow decentralized decision-making to improve these decision-rules in many areas, thus loosening the time and information constraints of corporate leaders.

British firms were unable to adapt to these changing circumstances because of the business and social culture they had inherited. This culture, which discouraged the delegation of authority and encouraged individualism and loyalty to one's class and clique, reduced the efficiency of larger hierarchical organizations. Without a certain level of decentralized decision-making within a suitable management structure, many British firms found themselves unable to compete with their foreign counterparts. Yet the solution implied by some authors, including Chandler, that Britain would have been better off if its firms had adopted the new management structures, would have failed if British business culture did not also change. Understanding a

firm's strategy and structure is not enough; for cross-country comparisons, we must also know something about how people behave within this structure to be able to fully explain its performance.

Entrepreneurial failure, if we should call it that, needs to be examined not just in terms of the degree of profit orientation and risk aversion exhibited by Britain's entrepreneurs, but also by the management practices they used and the prevailing social attitudes that affected their performance. Thus the British were wedded to a style of managing their business that was useful in the early stages of the industrial revolution, but later became a hindrance. Decline came, not in general in an absolute sense (except for the loss of control of some markets), but relative to foreign developments. If there had been no organizationally-adept foreign competition, then in all likelihood we would not be discussing the decline of Britain, but instead the story of continued success of British entrepreneurship.

ENDNOTES

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1. Shiman, "Decline," ch. 1. On the debate see the essays in McCloskey, Enterprise; also Geary, "Accounting for Entrepreneurship"; Solomou and Weale, "Balanced Estimates," among many others.
2. See for example Elbaum and Lazonick, Decline; Chandler, Scale.
3. Pollard, Britain's Prime, pp. 265-71.
4. Maddison, Dynamic Forces, pp. 6-7, 49, 274-5.
5. Mokyr, "Industrial Revolution," pp. 4-6.
6. McCloskey, If You're So Smart, ch. 3.
7. Aldcroft, "Entrepreneur," p. 114; Payne, British Entrepreneurship; Landes, Unbound Prometheus; Chandler, Scale; Allen, "Entrepreneurship"; Lazonick, "Strategy."
8. Coleman, "Gentlemen"; Wiener, English Culture.
9. Perkin, Rise, p. 366; Coleman and MacLeod, "Attitudes."
10. Habakkuk, American and British Technology; Michie, "Finance"; Pollard, Britain's Prime; Kennedy, Industrial Structure. For an evaluation of many of these theories, see Shiman, "Decline," ch. 1.
11. McCloskey and Sandberg, "From Damnation."
12. For criticisms of the educational system see Wiener, English Culture; Pollard, Britain's Prime, ch. 3. The argument that the educational system's inadequacies were not so much the cause of industry's difficulties as the result of industry's lack of interest has been made in Keeble, Ability; Wrigley, "Technical Education"; Richardson, "Development," pp. 113-4; Chandler, Scale, pp. 292-3; Payne, "Entrepreneurship", p. 43-44.
13. Some historians have argued that inefficient and risk-averse capital markets were to blame for the poor performance of British industry. See Kennedy, Industrial Structure; Pollard, Britain's Prime, ch. 2. Yet most historians of British capital markets agree that despite a few isolated examples to the contrary, British firms' problems were not usually caused by capital market inadequacies. See Michie, "Finance"; Michie, "Options"; Cottrell, Industrial Finance, pp. 262-70; Edelstein, Overseas Investment, pp. 310-11.
14. Chandler, Scale, pp. 284-6.
15. Gourvish, "British Business," pp. 24, 26; Chandler, "Development"; Hannah, Rise.

16. Elbaum and Lazonick, Decline.
17. Elbaum and Lazonick, "Institutional Perspective"; Mass and Lazonick, "British Cotton Industry."
18. Lazonick, Competitive Advantage; Lewchuk, "Motor Vehicle Industry"; Lorenz, "Evolutionary."
19. See the discussion later on the electrical industry and the synthetic dye industry for examples of how American and German industries made the change.
20. Chandler, Scale, pp. 291-4.
21. See for example, Pollard, Britain's Prime, pp. 55-56; Payne, British Entrepreneurship; Aldcroft, "Entrepreneur"; Hannah, Rise; Chandler, Scale; Elbaum and Lazonick, "Institutional Perspective"; Lazonick, Competitive Advantage.
22. Simon, "Theories."
23. Nelson and Winter, An Evolutionary Theory, ch. 5.
24. Schumpeter, Capitalism.
25. Team theory has looked at the problem of designing a set of decision-rules for an organization with decision-making distributed to handle information available only at certain locations within the firm, but not the problem of what happens if the decision-rules must be periodically (and unpredictably) changed. See Marschak and Radner, Economic Theory; for further discussion see Shiman, "Decline," ch. 2.
26. In team theory, the payoff function is the profits gained from the results of the outcome function, which in turn represents the physical output of a and x.
27. However, different levels of authority may be granted, represented by larger or smaller sets of a^c within which the manager is allowed to act on his own.
28. Geanakoplos and Milgrom, "A Theory." For a discussion of information that is difficult to communicate and share, called "tacit information", see Nelson and Winter, An Evolutionary Theory, ch. 4.
29. Aghion et al., "Optimal Learning."
30. Kihlstrom, Mirman, and Postlewaite, "Experimental Consumption," p. 281.
31. Typical situations when authority will not be delegated are discussed in Shiman, "Decline," ch. 2, such as when a subordinate has lesser ability than the entrepreneur, and when coordination between different activities by the entrepreneur is needed. However, a full model is not yet possible, until a better theory of how information is obtained, processed, and communicated within the firm is developed.
32. Holmström, "On the Theory." For a discussion of opportunism, see Williamson, Economic Institutions. We have no evidence that the dangers of fraud and laziness by subordinates were any greater in Britain than in the US and Germany. In fact, even educated Germans in Britain were not

delegated authority in the chemical industry, some of whom moved back to Germany to positions of authority. Shiman, "Managerial Inefficiency."

33. See the section "Possible Roots of British Management Style" below for a discussion of cultural influences.

34. From the lack of delegation of authority we can theoretically explain, using appropriate assumptions within the framework described above, some well-known stylized facts about British industry, such as the autocratic rule of entrepreneurs, the low levels of R&D funding and the incomplete rationalization of mergers. See Shiman, "Decline," ch. 2.

35. Leibenstein, "Allocative Efficiency."

36. It is difficult to statistically compare the efficiency of British firms with that of American and German firms. In terms of costs, British firms may have appeared to be effective at lowering their current cost of production, while missing profitable opportunities for expansion (meaning they had a high cost of developing new products, which were therefore never produced). And as is well-known, there are many difficulties in measuring and interpreting rates of return. Neoclassical economics therefore fails to provide the tools needed to analyze this type of problem. We could say then, that while British markets had a low level of static inefficiency (since they were relatively open and free), they had higher dynamic inefficiency, and possibly higher x-inefficiency.

37. While many goods could be imported (with a delay), the slowness of British organizations in adopting, efficiently utilizing and marketing new products hurt the spread of new technologies and the development of new national standards. This was particularly evident in the electrical engineering industry, whose problems helped slow electrification of British industry.

38. Schumpeter, Capitalism. By larger firms we do not mean firms with just a larger volume of sales, but instead firms involved in more markets, with a wider product line, and handling problems in a variety of areas. The concern here is with the organizational diversity and sophistication of the management structure. Firms with large volumes of sales (and large economies of scale) could remain organizationally simple, such as in the chemical industry. Even large bureaucracies might have large numbers of employees doing simple routine tasks, rather than handling new developments in many different areas.

39. See Shiman, "Decline," ch. 3, for an extended discussion of these issues.

40. However, when the technology was complex and the industry was developing quickly, even smaller firms might need specialists in R&D, production and marketing working together through a hierarchical structure. This was evident in the early years of the electrical engineering industry and the dye industry, when specialists in complementary fields were needed to continue the development of their industry's products.

41. It is not surprising then that Marconi, the inventor of the wireless telegraph, came to Britain from Italy to perfect and market his new invention, because of the external economies available in terms of financing, support, and demand. Pocock, Early British Radio Industry.

42. Allen, "Collective Invention."
43. Note that developing the new bureaucratic structures was not easy, and required much experimentation. German dyestuff firms experimented with different methods of sponsoring R&D, as did American electrical engineering firms. See Beer, Emergence, pp. 77-80; Brittain, "C.P. Steinmetz." Even the most important American innovators in organization, the railroads and Du Pont, were groping along trying to find the optimal structure. See Chandler, Scale; Zunz, Making America Corporate, ch. 2-3.
44. Tolliday, Business; Chandler, Scale; Hannah, Rise; Reader, Imperial Chemical Industries.
45. Chandler, Scale; Hannah, Rise; Gourvish, "British Business"; Shiman, "Decline," ch. 6; Wilson, History.
46. Passer, "Development," pp. 383-7; Porter and Livesay, Merchants, pp. 184-91.
47. Keeble, Ability.
48. Musson, Enterprise, pp. 101, 157-8; Wilson, History.
49. Mowery, "Industrial Research"; Mowery and Rosenberg, Technology; Shiman, "Decline," ch. 8.
50. Church, "Kenricks,"; Coleman, "Courtaulds and the Beginning of Rayon."
51. Hannah, Rise, pp. 120-21; Hannah, "Visible," pp. 43-44; Chandler, Scale, p. 297.
52. See Shiman, "Decline," ch. 6; Haber, Chemical Industry, 1900-1930, p. 320; Haber, Chemical Industry during the Nineteenth Century; Richardson, "Chemicals."
53. Lindert and Trace, "Yardsticks."
54. Shiman, "Decline," ch. 6; Hannah, Rise, pp. 81-85; Chandler, Scale, pp. 358-66; Gourvish, "British Business", pp. 27-28; Reader, Imperial Chemical Industries.
55. Beer, Emergence, pp. 30-31.
56. Beer, Emergence; Richardson, "Development"; Shiman, "Managerial Inefficiency."
57. Byatt, British Electrical Industry, Table 32; Hughes, Networks; Shiman, "Decline," ch. 5.
58. Shiman, "Managerial Inefficiency"; Chandler, Scale, pp. 276-77.
59. Hughes, Networks; Passer, Electrical Manufacturers; Shiman, "Decline," ch. 5.
60. Wilson, Ferranti, p. 12.
61. Shiman, "Decline," ch. 5; Wilson, Ferranti; Byatt, British Electrical Industry.

62. Ewing "The Hon. Sir Charles Parsons," p. viii; Gibb, "Parsons," p. 213; Appleyard, Charles Parsons.
63. Shiman, "Decline," ch. 5.
64. Aldcroft, "British Railways", p. 171; Chandler, Visible Hand, ch. 5-6; Zunz, Making America Corporate, ch. 2. This argument has been disputed -- see Gourvish, Railways, pp. 44-45.
65. Chandler, Scale, p. 254; Aldcroft, "British Railways."
66. Allen, "International Competition"; Allen, "Entrepreneurship"; Elbaum, "Steel Industry"; Erickson, British Industrialists; Tolliday, Business.
67. Lorenz and Wilkinson, "Shipbuilding Industry"; Lorenz, "Evolutionary."
68. Lewchuk, "Motor Vehicle Industry"; Wilkins and Hill, American Business Abroad, p. 85.
69. Mass and Lazonick, "British Cotton Industry," p. 18; Lazonick, Competitive Advantage.
70. Wilkins, "The Free-Standing Company."
71. Yergin, The Prize, pp. 64-71.
72. Miller, Men, pp. 286-93; Zunz, Making America Corporate; Chandler, Visible Hand. Note that only a minority of American and German firms installed the right organizational structures and corporate culture to allow effective decentralization of decision-making to technically and commercially trained managers. These firms were, however, generally the most successful firms, because of their large effective organizations.
73. Urwick, "Promotion," p. 185.
74. Lazonick, "Strategy," p. 122; Keeble, Ability, pp. 58-9, 81.
75. Lazonick, "Strategy," pp. 125; Zunz, Making America Corporate, ch. 5.
76. Shaw, "British Entrepreneurs," pp. 49-57; Jeremy, "Anatomy"; Erickson, British Industrialists, Tables 19, 21; Newcomer, Big Business Executive, Tables 36, 45; Keeble, Ability, pp. 126-7; for a fuller discussion of these statistics, see Shiman, "Decline," ch. 9.
77. Business leaders sometimes complained about the educational system, but there was a large gap between what they said they wanted and what they were willing to support. As noted by one professor in the 1960s, "we discovered in our successive inquiries that one of the least reliable ways for finding out what industry needs is to go and ask industry." Keeble, Ability, pp. 88, 160.
78. Keeble, Ability, ch. 6.
79. Clark, Donkeys; Shiman, "Decline," ch. 9.
80. Barnett, Swordbearers, p. 184; Marder, From the Dreadnought, vol. 3, p. 22.

81. Beer, Emergence, pp. 77-80.

82. Perkin, Origins, pp. 221-6.

83. Perkin, Rise, p. 27.

84. Chandler, Scale; Coleman, "Gentlemen"; Lazonick, "Strategy." For an interesting attempt at understanding how cultural attitudes and especially delegation of authority affects business performance in the US and Latin America, see Cochran, "Cultural Factors."

85. Keeble, Ability, p. 54.

86. Byatt, British Electrical Industry; Shiman, "Decline," ch. 5; Keeble, Ability, p. 54.

87. Wilson, "Strategy," p. 209.

88. Keeble, Ability, p. 128.

89. Hannah, Rise, pp. 174.

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