backwardness. However, from the 1680s it displayed a striking social, personal, and economic fluidity and struck most visitors as distinctly different. Its social elite was more open than most in Europe, with few rigid barriers between the mercantile and commercial world and the old wealth of land. Marriage could take place freely between the two without serious loss of status. The social position of women was relatively strong: they were regarded as freer than their European sisters in behavior and movement, if disadvantaged by property laws. The country's middling sorts were major agencies of improvement, through turnpike road or river navigation or in the aspirational public sphere of assembly room, infirmary, or circulating library. And its artisans were robustly independent, extensively literate, and much given to the public reading of newspapers in alehouse or coffee shop. Long before the advent of industrialization, Great Britain was following a rather different path from that of the nonconstitutional monarchies of mainland Europe.

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JOHN CHARTRES

ENTREPRENEURSHIP. The entrepreneur is a leading character in many accounts of economic growth. He appears in business biographies as a charismatic founder of a company; in industry studies as a prominent innovator, or a leading figure in a trade association or cartel; and in general economic histories as one of the hordes of self-employed small business owners who confer flexibility and dynamism on a market economy. Entrepreneurship is not confined to the private sector; it can also be discerned in the personalities of people who establish progressive charitable trusts and reform government administration.

Yet this very ubiquity of the entrepreneur is a cause for concern. Entrepreneurship means different things to different historians. It is rarely defined explicitly, and controversies over entrepreneurship often involve questions of semantics as well as fact. Few definite hypotheses have been deduced from theory, and few lawlike generalizations have been advanced from case-study evidence.

Economic Theories of the Entrepreneur. The term *entrepreneur* appears to have been introduced into economic theory by Richard Cantillon (1759), an Irish economist of French descent. According to Cantillon, the entrepreneur is a specialist in taking on risk. He "insures" workers by buying their output for resale before consumers have indicated how much they are willing to pay for it. The workers receive an assured income (in the short run, at least), while the entrepreneur bears the risk caused by price fluctuations in consumer markets.

This idea was refined by the U.S. economist Frank Knight (1921), who distinguished between risk, which is insurable, and uncertainty, which is not. Risk refers to recurrent events whose relative frequency is known from past experience; uncertainty relates to unique events whose probability can be only subjectively estimated. Knight thought that most of the risks relating to production and marketing fall into the latter category. Since business owners cannot insure against these risks, they are left to bear them by themselves. Profit is a reward for bearing this uninsurable risk: it is the reward of the pure entrepreneur.

Popular notions of entrepreneurship are based on the heroic vision of Joseph A. Schumpeter (1934). The entrepreneur is visualized as someone who creates new industries, thereby precipitating major structural changes in the economy. The entrepreneur innovates by carrying out new combinations. He is not a pure inventor, because he adopts the inventions made by others; nor is he a financier, because he relies on bankers to fund his investments.

The entrepreneur makes the crucial decision to commit resources to the exploitation of new ideas. An element of calculation is involved, but it is not pure calculation because not all of the relevant factors can be accurately measured. He is motivated by profit, but not purely by profit: the other motivators include the "dream and the will to found a private kingdom"; the "will to conquer: the impulse to fight, to prove oneself superior to others"; and the "joy of creating."

Schumpeter was concerned with the "high level" kind of entrepreneurship that historically has led to the creation of railways, the development of the chemical industry, and the growth of integrated oil companies. His analysis left little room for the much more common, but no less important, "low level" entrepreneurship carried on by small firms, particularly by those in the wholesale and retail trades. Alfred Marshall (1919) described the role of these firms in some detail but omitted them from his formal analysis of supply and demand.

The essence of low-level entrepreneurship can be explained by the Austrian approach of Friedrich A. von Hayek (1937) and Israel M. Kirzner (1973). Entrepreneurs are middlemen who provide price quotations as an invitation to trade. While bureaucrats in a socialist economy have little incentive to discover prices for themselves, entrepreneurs in a market economy are motivated to do so by profit opportunities. They hope to profit by buying low and selling high. In the long run, competition between entrepreneurs arbitrages away price differentials; but in the short run, such differentials, once discovered, generate a profit for the entrepreneur.

Judgmental Decision-Making. The insights of these economists can be synthesized by identifying an entrepreneurial function that is common to all approaches. This is the exercise of judgment in decision making (Casson, 1982). Thus, a middleman who buys before he knows the price at which he can resell must make a judgment about what the future price will be, while an innovator must assess whether a new product will prove attractive to consumers.

If information were freely available and could be costlessly processed, then there would be no need for judgment, and no mistakes would ever be made. But in practice, information is costly. Decision makers cannot afford to collect all the information they need, and so they have to act under uncertainty. But the uncertainty faced by one person may be different from the uncertainty faced by another. Sources of primary information are highly localized; for example, only people "on the spot" can directly observe an event. Different people in different places will therefore have different perceptions of any given situation. They may therefore make different decisions. The nature of the decision thus depends on the identity of the person who makes it. The entrepreneur matters because his or her judgment of a situation is potentially unique.

If a situation recurs frequently, it is worthwhile investigating it carefully in order to derive a suitable decision rule. The information required to implement the rule can then be collected on a regular basis. Once this optimal decision rule has been specified, there is no further need for the entrepreneur. Now consider the opposite case of an entirely novel situation, which is complex to analyze and where a decision has to be made quickly. It is so unusual that it never pays to investigate it fully. Nobody knows the correct decision rule. To improvise a decision quickly, people have to rely on their intuition and on any relevant information that they can retrieve from their memory. Different intuitions, combined with different memories, lead to different decisions.

The greater the cost of a mistake, the greater the importance of finding the appropriate person to make the decision. The cost of a mistake depends upon the value of the resources involved and the extent to which an erroneous decision can be reversed before it is too late. The greater the "sunk costs" involved, the more important the quality of judgment becomes, and the more important it is that the decision is made by a fully competent entrepreneur.

The Supply of Good Judgment. People differ in their quality of judgment. In a free society, people are allowed to decide for themselves whether their judgment is good. In choosing their occupations, people who are confident that their judgment is good will tend to gravitate to jobs that call for intensive use of judgment, while those who believe that their judgment is bad will gravitate to jobs where other people make decisions for them. On this view, entrepreneurs will *specialize* in making judgmental decisions. Specialization is rarely complete, however: most entrepreneurial roles also involve some minor routine, as well as ritual activity, such as making speeches. Specialization in entrepreneurship is not total, therefore, but a matter of degree. Although everyone makes judgmental decisions from time to time—such as whether to marry, or change jobs, or relocate—entrepreneurs specialize in making these decisions on behalf of other people.

Not all entrepreneurs are successful. There is a strong bias in the historical literature toward successful entrepreneurs, for fairly obvious reasons: Successful entrepreneurs make an impact on the national economy; they are inclined to self-promotion; and the enterprises they create survive long enough to leave good records. The successful entrepreneurs are those whose confidence in their judgment turns out to be well placed. For every high-profile success, however, there are numerous failures. Small start-up businesses are notoriously prone to failure in the first two to three years. Failures are often caused by overconfidence—though bad luck may also play a part.

Entrepreneurship is a scarce resource, and so it is important to know whether its supply can be increased. This raises the question of whether entrepreneurs are "born" or "made." There is little evidence that entrepreneurial ability is inherited: the evidence on family firms suggests that sons usually display less initiative than the fathers they succeed. There is some support for the idea that entrepreneurial qualities are incubated in adversity. Fatalistic acceptance of poverty is certainly not an entrepreneurial characteristic, but determination to reverse an economic setback often seems to be (Brenner, 1983). Many entrepreneurs claim to be "self-made," but it is impossible to know whether, in making this claim, they are simply unwilling to give credit to parents, teachers, and others who have helped them along the way.

The Contractual Position of the Entrepreneur. A good deal of historical evidence is based on the archives of firms; and in applying the theory of entrepreneurship, it is obviously important to know which members of a firm are entrepreneurs—the owner, the chief executive he employs, or both?

In a market economy, specialization by entrepreneurs takes two main forms. In the first, the entrepreneur is an employee, and in the second he or she owns a firm in which others invest. Looked at from the point of view of an entrepreneur, the problem is how to gain control of resources on a significant scale with modest personal means. One method is to obtain a job that gives scope for the exercise of judgment over how the employer's resources are used; the other is to become self-employed and borrow sufficient funds to buy the requisite resources.

Many business biographies clearly demonstrate that entrepreneurial initiative is often supplied by imaginative and committed employees. It is a mistake to regard the archetypal entrepreneur as the owner of a small firm. Many successful owner-entrepreneurs have first acquired their experience by exercising their talents as someone else's employee—often in a large professionally run firm. They left their previous employment to found their own business only when their self-confidence had grown to the point where they felt that the constraints upon them had become too great, and that the prospective rewards for success were too small.

Information Synthesis. Decision making normally requires the synthesis of different types of information. The high-level entrepreneur of the Schumpeterian type, for example, needs to synthesize information about new inventions with information about trends in product demand, and in the prices of raw materials, in order to determine whether an innovation is worthwhile. If the entrepreneur does not possess this information himself, then he must know where to acquire it. If some of the information is confidential, then it will have to be acquired through personal contact rather than from published sources. The entrepreneur, therefore, needs to create a network of social contacts that can feed him the information that he requires.

Location in a major metropolis is a great advantage from this point of view. This is the place where travelers often call first when arriving from overseas; it is where journalists collect information for their stories, and where groups of people assemble to make important decisions—politicians in parliament, business leaders at their headquarters, and so on. Entrepreneurship is a distinctly urban activity.

Geographical Mobility of the Entrepreneur. It was noted above that everyone makes decisions from time to time. Entrepreneurs will reveal their qualities by the kind of choices they make. Young people have to decide, at some stage, whether to remain in the place they grew up or to move elsewhere. Entrepreneurial people are more likely to move and nonentrepreneurial people to stay. Isolated rural areas where there are few opportunities for profit tend to selectively lose their more entrepreneurial young people. Conversely, large cities tend to attract entrepreneurial young people.

"Push" as well as "pull" factors may stimulate migration—an extreme example being the expulsion of ethnic minorities by totalitarian political regimes. This may range from the persecution of religious sects, to the dispossession of peasants, to the expropriation of a wealthy merchant class. While such measures do not discriminate between entrepreneurs and nonentrepreneurs in terms of whether people move, they may well discriminate in terms of where the migrants terminate their travels. The least entrepreneurial may well stop at the first place of refuge, while the more entrepreneurial may continue in search of the most promising location.

While immigrants who have been expelled from other countries might be thought to be, on balance, less entrepreneurial than the purely "economic" migrant, the effect of their adversity on their motivation should not be overlooked. If loss of wealth and status stimulates a desire to restore the family's fortunes, then expulsion may turn into a very powerful motivator of success.

The Institutional Framework. Entrepreneurs who are prepared to move long distances have a choice of political regimes under which to operate. The regimes that are most attractive to mobile entrepreneurs are likely to possess the classic institutions of the liberal market economy. They will have some or all of the following characteristics:

- Private property, which is freely alienable, subject to certain minimal restrictions;
- Freedom of movement and freedom to associate with business partners;
- Confidentiality of business information, especially regarding relations with customers and suppliers;
- Protection of creative work through patents, copyright, design protection, and so on;

- Access to impartial courts, which will enforce property rights and which have the competence to settle complex commercial claims;
- A stable currency, based on prudent control of the money supply;
- Democratic government, with sufficient balance of power between opposing interests to reduce the risks of Draconian interventions in industry and commerce;
- Openness to immigration by entrepreneurs and skilled workers (and possibly other groups as well).

Entrepreneurs not only move between industries within the private sector: they also can move between the private sector, the nonprofit sector, and the government sector. Choice of sector will reflect the entrepreneur's preferences. Some entrepreneurs consider the importance of pecuniary rewards and the scope for innovative behavior in the private and public sectors.

Occupational Mobility of the Entrepreneur. The relative mobility of the entrepreneur applies to occupation as well as to location. Young men who remain behind in a locality may well follow their father into the same line of business. Where father is an employee, they follow him "into the works" or "down the pit." To those with narrow horizons and a parochial outlook, any long-standing local industry may appear secure. Such nonentrepreneurial workers may eventually join the ranks of the "structurally unemployed."

The same mechanism applies in a family firm (Church, 1993). "One day all this will be yours," the father tells the son, and the son feels morally obliged to succeed his father, even though his interests lie elsewhere. A more entrepreneurial son might turn down the offer and set up his own business in a different industry, forcing the father to look outside the family for a successor—possibly with beneficial results for the firm.

Business owners who remain behind in a declining industry or region may join forces to lobby for protective tariffs or industrial subsidies. They harness organizations, such as trade associations, which originally may have been established to provide training, for price-fixing purposes instead (Olson, 1982). A secretive and conspiratorial business culture develops, reflecting the entrepreneurial weaknesses of the business group. Similarly, craft guilds or trades unions may try to "protect jobs" by resisting technological change. Inflexible attitudes within a region may deter entrepreneurs in "sunrise" industries, who move away to areas where they have more freedom of action. This suggests that successive waves of innovation will move around a country, avoiding areas where earlier innovations have stagnated and ossified the business culture (Pollard, 1981). Only the metropolis will remain vibrant because of its continuing ability to attract young entrepreneurs. If the metropolis, too, goes into decline, then the outlook for the entire national economy is likely to be bad.

Historical Applications of the Concept of the Entrepreneur. Early academic writers on British economic and social history employed the concept of the entrepreneur mainly as a social stereotype. The Victorian entrepreneur was a member of an upwardly mobile lower middle class, imbued with the bourgeois values of proprietary capitalism. The Victorians themselves seem to have been more impressed with their own engineering feats than with their entrepreneurial achievements; thus it was the civil and mechanical engineers, rather than the railway promoters or the company secretaries, that were seen as the heroes of the Railway Revolution (Smiles, 1862). More generally, it was the creation of the empire, rather than an entrepreneurial domestic economy, that was the main political preoccupation. Modern interest in Victorian entrepreneurship is more a reflection of a desire to recover something that has been lost than the continuation of a concern that the Victorians themselves expressed.

In the United States, a powerful mythology developed around the "rags to riches" entrepreneur (Sarachek, 1978), but detailed investigations (see, for example, Taussig, 1915) highlighted the middle-class professional origins of many successful entrepreneurs.

Schumpeter (1939) provided one of the earliest economic applications of entrepreneurial theory. He identified five main types of "new combinations" effected by entrepreneurs: new products, new processes of production, the development of new export markets, the discovery of new sources of raw material supply, and the creation of new forms of institution, such as the cartel or trust. Schumpeter's classification fits well with the major forms of innovation that occurred in Europe during the "Age of High Imperialism," from 1870 to 1914. The large-scale entrepreneurial exploits of the "robber barons" of the late nineteenth century—Cornelius Vanderbilt, E. H. Harriman, John D. Rockefeller, and so on—also conform well to Schumpeter's model. Schumpeter claimed that his schema fitted any economy that made extensive use of credit—from the growth of Mediterranean trade during the Renaissance onward. He also claimed that he could explain Kondratieff "long waves" of fifty to sixty years' duration by the periodic clustering of innovations since the Industrial Revolution. Unfortunately, however, the empirical basis of Schumpeter's speculations on long waves has not stood the test of time very well (see Solomou, 1987).

Pursuing the Schumpeterian theme, Hughes (1965) examined the influence of the "vital few" in promoting economic growth. Hughes's approach is mainly biographical, emphasizing the personality factor in entrepreneurship. The great value of his contribution lies in the fact that he recognizes the role of the entrepreneur in the public as well as the private sector, although he sees the public sector entrepreneur as heavily implicated in the growth of bureaucracy. The policy implication of Hughes's study appears to be that people with entrepreneurial personalities need to be attracted into the private sector where, thanks to competitive markets, the incentives are better aligned with the long-run public interest.

A rather similar conclusion arises from Jones's (1981, 1988) studies of long-term world economic growth. Adopting an international comparative perspective, Jones argues that entrepreneurship is a natural feature of human behavior that government can either encourage or suppress. Encouragement is provided by a regime of freedom under law, which allows people to carry out experiments in commercial and industrial organization at their own expense. Suppression is effected by governments that fall into the hands of elites, who think they know best which experiments are socially desirable and which are not. They subsidize prestigious experiments out of taxes, and repress ordinary experiments because they are seen as either useless, immoral, or politically subversive.

The Debate on Entrepreneurial Decline. The most substantive recent discussion of entrepreneurship has focused on the alleged decline of entrepreneurship in Great Britain after 1870 (see, for example, Aldcroft, 1964; Sandberg, 1981). This decline is seen as having both technological and cultural roots (Wiener, 1981). One of the major symptoms of failure is said to be lack of investment in new technologies in key industries. It has been correctly pointed out, however, that good entrepreneurship does not always mean deciding to invest, for in many situations the correct decision is not to invest at all. Nor is innovation always an indicator of good entrepreneurship; it sometimes pays to let others make the first move, and to learn from their mistakes.

A complete analysis of Britsh entrepreneurial decline needs to embed the issue within a wider perspective. In late-Victorian Great Britain there was significant emigration of entrepreneurial individuals who left to colonize the growing empire. The London capital market played a major role in channeling resources to their overseas ventures. The great railway and mining entrepreneurs did not so much disappear as transfer their skills overseas once the domestic railway system had matured and traditional mining deposits had become exhausted. Supplies of entrepreneurship are finite, and migration is a selective process. It is therefore hardly surprising that the limited group of less entrepreneurial businessmen who remained behind in Great Britain, and inherited family businesses, concentrated their efforts on managing their existing Imperial export trade, rather than pioneering new industries, in the manner of entrepreneurs in countries that were attempting to "catch up" with Great Britain. Moreover, insofar as there were deficiencies in U.K. technological innovation, these may have more to do with the limitation of the English university system than with the quality of entrepreneurship per se—thus Clydeside entrepreneurs, drawing on the academic engineering expertise of Scottish universities, were very active in high-technology shipbuilding throughout the period of "decline."

The Market for Entrepreneurs. The demand for entrepreneurship, like the demand for any other factor of production, is a derived demand. Unlike more conventional factors of production, however, the demand for entrepreneurship derives not from the overall level of product demand, but rather from the volatility of such demand. Volatility generates novel and complex situations that call for improvised decisions. When volatility increases, there is an increase in the demand for entrepreneurs and a corresponding decline in the demand for managers. This is normally reflected in the formation of more small firms and the restructuring of large firms. The large firms may disappear through bankruptcy, or be split up through management buyout and "asset-stripping"; alternatively, they may be reorganized in a more flexible form, as a coalition of entrepreneurs. Greater competition to hire entrepreneurial employees means that the rewards of entrepreneurship will rise. Pay structures will tend to become more flexible because it will no longer be possible to offer both entrepreneurial employees and nonentrepreneurial employees the same rates of pay.

Enterprise Culture. When there is a general perception in a society that volatility has increased, social and political attitudes may change as well. This is what appears to have happened in many Western industrial countries toward the end of the 1970s. Increasing awareness of global competition, and the failure of large-firm "national champions" to respond effectively, led people to believe that future job creation would come from small business. Start-up entrepreneurs became popular role models, creating a new set of myths about the "rags to riches" entrepreneur, and encouraging young people to make their careers in the private sector.

Considered as a historical phenomenon, the enterprise culture of the 1980s and 1990s was a natural reaction to some of the antientrepreneurial attitudes that had taken root in the West in the early postwar period. It should not be inferred, however, that this enterprise culture was based on a correct understanding of the role of the entrepreneur. The highly competitive and materialistic form of individualism promoted by "enterprise culture" did not accurately represent the dominant values of successful entrepreneurs of previous generations. For example, the Victorian railway entrepreneurs operated through social networks based in Great Britain's major provincial towns and cities. The limited amount of historical evidence that has been collected and analyzed in a systematic way suggests that successful entrepreneurship is as much a cooperative endeavor, mediated by social networks, as a purely individualistic and competitive one.

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ENVIRONMENT *[This entry contains two subentries, a historical overview and a discussion of environmental policies and regulation.]*

Historical Overview

With respect to the natural environment, the main concerns for economic historians are the opportunities and costs for settlement and production afforded or imposed by variations in the initial conditions of different ecosystems; the impact of human occupation; and the consequences or "kickback" of the drastic modifications that have taken place. The environment is taken here as comprising the whole human habitat: geology, landforms, and soils; deserts, forests, and plains; rivers and seas; the climate; competing and collaborating species, including those that make up the "disease environment"; and the "built environment" of cities. Much economic history explicitly or implicitly discusses waves of human occupation of various habitats, and the stages by which their use, or the use of elements within them, has repeatedly been intensified. The number of interactions is enormous and has changed kaleidoscopically. Nevertheless, economic historians have not paid nearly as much attention to the environment as ecologists, geographers, and adherents of the belief that there is a global environmental crisis.

Human Impact and Responses. Originally, humans resided as small groups in vast untouched savannas and forests; next, for several millennia, humans dwelt alongside nature, dominating only a few habitats such as large townscapes; lastly, in the industrial nineteenth and twentieth centuries, humans surrounded nature, often reducing pockets of relatively unaltered vegetation to enclaves and corralling wildlife in reserves. This suggests a crescendo of unpleasing changes but that is a one-sided view: modern economies have created enough wealth to encourage a taste for "wild" nature, formerly ignored or abhorred, and provided the wherewithal to reserve areas of natural land in which to house it. They have also become rich and interested enough to conserve once-threatened species and to bring about the numerical recovery of some of them, at times to pest proportions. A "Kuznets curve" has been found in the forested area of Thailand, meaning that forests shrank in the early stages of development but began to expand again once high levels of income were attained. The crossover point from deforestation to reafforestation came c. 1973 at a per-capita GDP of U.S. $1,000. In several European countries an equivalent crossover may have taken place around 1890 at a per-capita GDP level of about $1,750.

That one species, *Homo sapiens*, has become so numerous and virtually ubiquitous in its distribution, as well as a heavy user of an infinite range of natural products, has created almost tautologically a massive impact. Other species have been moved aside, reduced in numbers, and sometimes driven to extinction. In the process habitats have been altered, often becoming simpler, though with their energy flows expanded. The main agency has been the replacement of natural vegetation by higher and higher yielding crops specially bred to maximize such desirable properties as food and fiber. Although the agricultural area has been immensely extended, the damage to the diversity of species has often been surprisingly slight. For example, 90 percent of the Amazonian forests in Brazil was cleared with no loss of species. Everywhere the mix and populations of nonhuman species have been transformed, yet claims that large numbers of extinctions are still occurring are often propaganda by nongovernmental organizations acting as "green" firms and competing for subscriptions by announcing one alleged threat or loss after another.