The Entrepreneur in Economic Theory

... he was ... the entrepreneur extraordinaire, with all the requisite traits for the role: nerve, persistence, dynamic energy, a talent for propaganda, a capacity for deception, imagination.

A description of Ferdinand de Lesseps in McCullough (1977, p. 53)

It is, as a business proposition, a matter of indifference to the man of large affairs whether the disturbances which his transactions set up in the industrial system help or hinder the system at large, except in so far as he has ulterior strategic ends to serve.

Veblen (1904, pp. 29-30)

The objective of this book is to help in reviving the theory of the entrepreneur-leader, and to point out ways in which one can resume the study of that individual's role in economic growth. In short, the book is an attempt to provide a contribution to the arena I once labeled the "magnificent dynamics." Here the place of the entrepreneur is well recognized and generally accepted. In a word, the entrepreneur's productive contribution is innovation. But it will be argued here that this credits him or her with too little, and also with too much.

One of the central arguments of the book is that the entrepreneur often makes no productive contribution at all, and in some cases plays a destructive role, engaging in what Veblen described as "systematic sabotage" of production. This does not happen fortuitously, but occurs when the structure of pay-offs in an economy is such as to make unproductive activities such as rent seeking (and worse) more profitable than activities that are productive.

The other side of the matter is that the term innovation does not give productive entrepreneurs sufficient credit for their contributions to technological progress and growth. Technological progress has at least two dimensions, one of which is widely ignored in the literature. It depends both on the rate of flow of pertinent new ideas and on the speed with which they are disseminated and adopted throughout the productive activities of the world. Where products are differentiated (as is true of most "high-tech" activities) or where commodities are consumed and produced locally, goods can be supplied by many sources using different technology and
different product specifications. If only one of the many producers of some good uses a valuable innovation, obviously productivity will benefit far less than if the innovation is adopted universally. Thus the greater the speed of dissemination of new technology, the more it contributes to productivity. That much seems obvious. But what is not obvious about the proposition are two associated observations that will be explored later. First, reasons will be offered suggesting that, despite its more limited glamour, speed of dissemination plays a role in its influence on productivity growth fully comparable to that of rate of innovation. Second, it will be argued that the speed of dissemination of new ideas is not a matter of happenstance, but is heavily influenced by market forces acting through the agency of the entrepreneur. Indeed, the entrepreneur plays as important a role in dissemination as in innovation. Thus several chapters are devoted to the dissemination of technology and the entrepreneur’s role in the process.

1.1 Different Roles: Entrepreneurs and Managers

The entrepreneur is at once one of the most intriguing and one of the most elusive in the cast of characters that constitutes the subject of economic analysis. Long recognized as the apex of the hierarchy that determines the evolving behavior of the firm, the entrepreneur is thereby assigned a heavy responsibility for the vitality of the free-enterprise society. In the writings of the classical economists the appearance of this important figure was frequent, but shadowy, without clearly defined form and function. In the literature of formal theory, at least until very recently, only Joseph Schumpeter and, to some degree, Frank Knight succeeded in infusing this character with life and assigning to him or her a specific area of activity to any extent commensurate with his acknowledged importance. But to do so, they were forced to sacrifice analytic tractability and even substantive mathematical representation. In more recent years, although economic events continue to underscore the significance of his role, the entrepreneur has nonetheless virtually disappeared from the theoretical literature. And as we will see, while some recent theoretical writings seem at first glance to offer a convenient place for an analysis of entrepreneurial activities, closer inspection indicates that matters have not really improved substantially on this score.

This chapter focuses on three issues. First, it reviews briefly the reasons why entrepreneurship should concern us. Second, it seeks to explain why economic theory has failed to provide an illuminating formal analysis of the decision process of the entrepreneur and concludes that it is also unlikely to be able to do so in the future. Finally, it suggests ways in which theory may be able to say a great deal that is highly relevant to the subject of entrepreneurship, even if it fails to provide a rigorous analysis of the behavior of the entrepreneur or of the supply of entrepreneurial ability.

But before proceeding with the discussion, it is helpful to propose a semantic distinction that is somewhat artificial but nevertheless important. It will be useful for our purposes to differentiate between the entrepreneurial and the managerial functions, though, as Schumpeter emphasized, the same persons at different times are likely to go from the one type of activity to the other (1936, p. 78). We may define the manager as the individual who oversees the ongoing efficiency of continuing processes. It is the manager’s task to see that available processes and techniques are combined in proportions appropriate for current output levels and for the future outputs already in prospect. The manager sees to it that inputs are not wasted, that schedules and contracts are met, that routine pricing and advertising outlay decisions are made, that simple growth processes entailing no novel procedures take place, and so on. In sum, the manager takes charge of the activities and decisions encompassed in the traditional models of the firm.

The preceding description is not intended to denigrate the importance of managerial activity or to imply that it is without significant difficulties. Harvey Leibenstein and Carl Kaysen, among others, have suggested
that in practice most firms do not operate at maximal efficiency—in economist's terms, they occupy positions well inside their production frontiers—and one of their most challenging tasks is to find ways of approaching those loci more closely, that is, of increasing their efficiency even within the limits of known technology and familiar practice. This is presumably part of the job of the manager, who is constantly on the lookout for ways to save a little here and to squeeze out a bit more there. But though the standard theoretical models usually proceed on the assumption that the firm is able to arrive at decisions that serve its purposes optimally and, hence, efficiently, for many purposes these models would appear to provide a useful and analytically tractable description of the functions of the manager. Once aware of an arrangement that calculation, experience, or judgment indicate constitute something close to the current optimum, the manager must see that this arrangement is in fact instituted to a reasonable degree of approximation. The entrepreneur (whether or not she also doubles as a manager) has a different role. It is her job to locate new ideas and to put them into effect. She must lead, perhaps even inspire; she cannot allow things to get into a rut and, for her, today's practice is never good enough for tomorrow. In short, she is the Schumpeterian innovator and more. She is the individual who exercises what is called "leadership" in the business literature. And it is she who is virtually absent from the received theory of the firm.

1.2 On the Significance of the Entrepreneur

If we are interested in explaining what Trygve Haavelmo has described as the "really big dissimilarities in economic life," we must be prepared to concern ourselves with entrepreneurship. For the really big differences are usually those that correspond to historical developments over long periods of time or to the comparative states of various economies, notably those of the developed and the less developed areas. They encompass contrasting developments such as the meteoric rise of some economies, like that of Japan, the fall from leadership position by others, and the prospects for still other economies whose future relative position appears to hang in the balance.

It has long been recognized that the entrepreneurial function is a vital component in the process of growth of output and productivity. Recent empirical evidence and the lessons of experience both seem to confirm this view. For example, most empirical studies on the nature of the production function have concluded that sheer capital accumulation and expansion of the labor force leave unexplained a substantial proportion of the historical growth of the nation's output. Thus, in a well-known paper, Solow (1957, p. 320) has suggested on the basis of American data for the period 1909–1949 that "gross output per man-hour doubled over the interval, with 87.5 percent of the increase attributable to technical change and the remaining 12.5 percent to increase in the use of capital." But any such innovation, whether it is purely technological or constitutes a modification in the way in which an industry is organized, will require entrepreneurial initiative in its introduction. Thus we are driven to the view that by ignoring the entrepreneur we are prevented from accounting fully for a very substantial proportion of our historic growth.

Those who have concerned themselves with development policy have apparently been driven to similar conclusions. If we seek to explain the success of those economies that have managed to grow significantly, compared with those that have remained relatively stagnant, we find it difficult to do so without taking into consideration differences in the availability of entrepreneurial talent and in the motivational mechanisms that drive them on. A substantial portion of the energies of those who design plans to stimulate development has been devoted to the provision of the means whereby entrepreneurs can be trained and encouraged.
The entrepreneur also has a prominent place in institutional and applied discussions in a number of other economic areas. For example, his absence is sometimes cited as a significant source of the difficulties of a declining industry, and a balance — of — payments crisis is sometimes discussed in similar terms. Thus, analyses of both macroeconomic problems and microeconomic problems offer a substantial place for him. Whether or not he is assigned the starring role, he would appear to be no minor character.

1.3 The Schumpeterian Model: Brief Recapitulation

Since Schumpeter's model is the one analytical construct that deals directly with entrepreneurship as it is interpreted here, and since it comes up repeatedly throughout the book, a brief summary may not be redundant. It need hardly be said that a condensation inevitably excludes many of the subtleties and nuances of his original discussion, sometimes driving us to the verge of misrepresentation. Of course, those thoroughly familiar with the original will gain little from this section.

To bring out the workings of a world in which entrepreneurship plays its role, Schumpeter starts off, as contrast, with a static scenario which he calls "a circular flow," a world of routine in which every day is very much like the one that preceded it. In this model all decisions have already been made, and all the alternatives have been explored and compared, so that for every matter that was to be decided, the optimal choice has been adopted. Clearly, no economy has ever been like this—even the Dark Ages experienced innovation, as will be noted in somewhat more detail in Chapter 2, and even then, the relatively stationary economy can hardly be said to have elicited behavior that invariably attained anything like an ideal economic efficiency. Rather, the circular flow model is a useful analytical construct employed in Walrasian analysis and elsewhere to show what careful rational calculation can achieve in a world without uncertainty or change.

In Schumpeter's analysis, the entrepreneur intrudes into this eventless world, seeking opportunities to stir things up. She seeks opportunities for profit by exploiting situations that invite change. New products or new techniques for the production of goods and services previously available immediately come to mind as examples. But the opportunities for what Schumpeter calls "new combinations" go well beyond those two. They include the adoption of new and better (or cheaper) sources of input supplies, the opening of new markets, and the introduction of more profitable forms of business organization (even for the sake of acquisition of monopoly power). Anything that was not done before and that contributes to profit is within the domain of the entrepreneur.

Schumpeter thus defines the entrepreneur as the innovator, and in the process, carefully distinguishes the entrepreneur from either the inventor or the capitalist. Innovation is the act of putting a novel idea into operation—of bringing it from the drawing board into fruitful activity in the marketplace. Schumpeter wrote:

Economic leadership in particular must hence be distinguished from "invention." As long as they are not carried into practice, inventions are economically irrelevant. And to carry any improvement into effect is a task entirely different from the inventing of it, and a task, moreover, requiring entirely different kinds of aptitudes. Although entrepreneurs of course may be inventors, just as they may be capitalists, they are inventors not by nature of their function but by coincidence and vice versa. Besides, the innovations which it is the function of entrepreneurs to carry out need not necessarily be any inventions at all. It is, therefore, not advisable, and it may be misleading, to stress the element of invention as much as many writers do (1936, pp. 88-89).
Because Schumpeter's innovator is also not the capitalist, "The entrepreneur is never the risk bearer. The one who gives the credit comes to grief if the undertaking fails" (1936, p. 137). In this, Schumpeter's vision differs sharply from that of other students of the subject, who have frequently emphasized the important role of the entrepreneur as a taker of risk and confronter of uncertainty. But whatever the insight contributed by such an interpretation, it is not the vision of Schumpeter, who reiterates, "Risk-taking is in no case an element of the entrepreneurial function. Even though he may risk his reputation, the direct economic responsibility of failure never falls on him" (loc. cit.). Risk bearing is the task of Schumpeter's capitalist, and compensation for risk bearing is a significant component of the capitalist's reward.

The entrepreneur's profit is the key to economic growth in Schumpeter's model. By being the first to introduce a "new combination," the entrepreneur obtains temporary monopoly power. Lower costs may give her profits higher than those of her rivals, who must continue to sell at prices that cover their higher expenses. Or a superior product may permit a price above that charged by other firms. The same idea clearly fits all forms of successful innovation. But the heart of the growth mechanism is the fact that those profits are always temporary unless innovation recurs. This is clearly so if the market is competitive, because rivals will be faced with cumulative loss of market share if they ignore an innovation. They will be forced to find some way to imitate the innovation or to come up with an effective substitute. When they finally succeed in doing so, the entrepreneur's differential advantage will come to an end.

Even if the entrepreneur succeeds in establishing a monopoly whose returns continue indefinitely, Schumpeter argues that, as a matter of definition, the flow of gains to the entrepreneur in her entrepreneurial role must be very temporary. For as the flow of monopoly, earnings becomes expectable and routine it is transformed into monopoly rent rather than entrepreneurial profit: "The carrying out of the monopolistic organization is an entrepreneurial act and its 'product' is expressed in profit. Once it is running smoothly the concern in this case goes on earning a surplus, which henceforth, however, must be imputed to those natural or social forces upon which the monopoly position rests" (1934, p. 152). The argument becomes very clear if we envision sale of the entrepreneur's interest in the firm to others at a price that corresponds fully to the expected earnings stream. For the new owners will then have paid a price for their asset so high that they can expect to earn only a zero economic profit, unless they, in turn, succeed in carrying out another innovation.

The upshot is that the entrepreneur who wants to continue to earn profits can never afford to rest on her laurels. She must follow the first innovation with a second and the second with a third, because otherwise the stream of profits will dry up as imitators succeed in bringing them to an end, or as the process of imputation transforms them into mere rents. Thus, by forcing the entrepreneur to run without respite in order to stand still, the pursuit of a continuing stream of profits serves as the powerful engine that injects a flow of changes into the workings of the economy. It is, in sum, the engine of growth.

1.1 The Entrepreneur: Definition, Classification, and Role

Any attempt at rigid definition of the term entrepreneur will be avoided assiduously here, because whatever attributes are selected, they are sure to prove excessively restrictive, ruling out some feature, activity, or accomplishment of this inherently subtle and elusive character. Rather, I will use the term to describe any member of the economy whose activities are in some manner novel, and entail the use of imagination, boldness, ingenuity, leadership, persistence, and determination in the pursuit of wealth, power, and position, though not necessarily in that order. In other words, the term is meant to encompass all nonroutine activities by those who direct the economic activities of larger or smaller groups or organizations. Because
measures that are not obvious or tried and true are that person's domain, innovation must indeed belong to that territory.

One is tempted to consider the entrepreneur's role in economic activity to be like that of the bold strategist in military ventures, the analog of Alexander the Great, Genghis Khan, the Duke of Marlborough, or Napoleon Bonaparte. Yet such a view is misleading, as Nathan Rosenberg has argued so cogently on the basis of systematic historical evidence (see, for example, 1976, essay 4). Rosenberg warns against excessive 'stress upon that charismatic figure, the entrepreneur, who possess[es] the character, courage and, above all, vision, to depart sharply from accepted routines and practices [As a result] inventive activity itself is never examined as a continuing activity ... and the stages through which inventions proceed on the way to full commercial application and exploitation, never emerge" (p. 67, my emphasis). The point is that both invention and innovation typically involve considerable periods of time and the participation of many individuals, a number in entrepreneurial roles, varying in dramatic scale, in the process that takes place between the initial idea and the first commercially viable products. Rosenberg's writings are filled with convincing examples, but one will suffice to bring out the point. The well-known tale of the flash of inspiration that paved the way to James Watt's improvements on Newcomen's steam engine may or may not have some element of truth. But it is certainly misleading. It took more then a decade, and the assistance of a politically powerful entrepreneur-capitalist partner, Matthew Boulton, from the date of Watt's first idea to the construction of a commercially viable model. During most of this interval Watt was unable to produce a full-sized engine that was marketable, in good part because it was not known how to bore a cylinder with the requisite accuracy. He was forced to turn to rudimentary expedients: "... the cylinder of his first engine was made of tin and hammered to shape against a hard wood block; the gaps between the piston and cylinder were sealed as far as possible with felt, paper, oiled rags, and the like" (K. R. Gilbert, quoted in Rosenberg, p. 305). The problem was only solved by an entrepreneur who happened to be located nearby, cannon maker John Wilkinson, who needed accurate boring methods for his own purposes. Still, when the first practical Watt-Boulton steam engine emerged in 1776, it required another quarter century of improvement and dissemination effort before it was able to make more "than a limited impact ... on the broad range of British industries" (Rosenberg, p. 326; for an illuminating but brief account of the development of Watt's steam engine, see Scherer [1986]).

Not everyone uses Schumpeter's interpretation of the term entrepreneur, which we will follow here, albeit in modified and broadened form. Of course, there is nothing inherently objectionable about alternative usages. Still, they seem less well adapted to the central purpose of this book, which is to explore the role of economic leadership in the determination of an economy's growth and to examine some of the policy options pertinent to stimulation of that growth through encouragement of the entrepreneur's productive exercise of inventiveness and his propensity to depart from currently standard practices. To avoid misunderstanding, it is worth reviewing briefly some of the alternative ways in which the term has been employed.

A. Business Founding and Management. Sometimes the entrepreneur is defined simply as either the organizer or the effective director of a business firm (see, for example, much of the discussion of Casson [1982]). But since the establishment of new firms may entail little that is innovative, and the company's operations may in some cases be almost entirely routine, it follows that at least some such persons are not entrepreneurs in the sense that is employed in this book. In addition, we want to consider economic activity that takes place outside private business firms, and even outside what anyone would be willing to describe as a firm of any sort. Consequently, it is not convenient to base the analysis on this first alternative connotation of our focal term.
B. Innovative Entrepreneurship. Others, following Schumpeter, take the entrepreneur to be anyone who engages in innovative activity, here defining innovation, in contradistinction to invention, as the process whereby the latter is put into practice, transforming a disembodied idea into a workable and economically viable operation. Innovations, in the sense used here, follow Schumpeter in encompassing not only novel productive techniques within the realm of engineering, but also new products, new input sources, new marketing methods, and new forms of business organization. This interpretation is not in conflict with that which will be used in this book; but for our purposes it will be convenient to broaden the concept still further. In particular, it will be important for our purpose to distinguish the following subcategories, which we will also take to constitute entrepreneurship, even if at least a narrow interpretation of the Schumpeterian line of argument might not.

C. Imitative Entrepreneurship. The term imitative entrepreneur will be used to refer to a person who is occupied in the transfer of technology or of other innovative ideas or procedures from one firm or one geographic location to another. The activity can have all of the hallmarks of that of the Schumpeterian innovator, except that the main novel element of the activity is the selection of a new location for, say, a process that may have become well accepted and routine elsewhere. In Schumpeter, as we have just noted, the imitator's role is entirely secondary, serving primarily to put an end to the innovator's domination of the market by virtue of novel and superior products or processes. The competition of the imitators robs the innovator of this temporary source of monopoly power, and forces that entrepreneur to embark once more upon the quest for profitable novelty, in order to prevent the innovative firm's profits from being reduced thereafter to no more than the normal level permitted by competitive forces during strictly routine operations. But, as will be seen, in our analysis the imitator plays a far more central, hardly secondary role.

In addition to this subcategory, our discussion will also concern itself with:

D. Unproductive Entrepreneurship. A key part of our story is the contention that the entrepreneur's activity can be, and in fact sometimes is, innovative, yet nevertheless make no contribution to the real output of the economy. Indeed, the activity can sometimes even serve to reduce output or restrain its growth. This abstract notion can be made clear by turning to our last category, itself a subgroup of the set of unproductive entrepreneurs.

E. Rent-Snecring Entrepreneurship. Rent seeking, a concept contributed by Gordon Tullock, refers to any activity whose objective is the acquisition of some of the monopoly profit or the economic rents currently generated or potentially available in the economy. For example, consider a regulated industry that is a bilateral monopoly. Suppose one of the monopolists is able to persuade the regulatory agency to readjust prices in a way that causes a larger share of the industry's total monopoly profits to flow into the coffers of that enterprise. Then it will have engaged in a successful act of rent seeking. Such an activity can clearly be innovative. A novel legal principle may, for example, be thought of and invoked by the rent seeker in persuading the regulatory agency to intervene in its favor. But the activity need not contribute anything to economic production or productivity. Indeed, as will later be discussed in somewhat greater detail, it can constitute an effective impediment to both of these, through misallocation of valuable resources into pursuits that from the viewpoint of the economy are useless, and by forcing the targeted firm to redirect its activities into unproductive directions for the sake of self-defense.

It is clear that entrepreneurship should not be taken as a synonym for virtuousness. Not everything that is entrepreneurial is necessarily desirable. That is, it cannot always be relied upon to promote the interests of society. Indeed, it is the contention of this book that one of the keys to rational policy relating to
entrepreneurship is to be found here—in the pursuit of means to discourage or prevent entrepreneurial talent from devoting itself to unproductive courses.

While one cannot rely upon entrepreneurs to contribute to production, there is one thing for which one can depend upon them. Ultimately, the entrepreneur's role is that of disturber of the economy; it prevents the economy from falling into a rut and precludes those who constitute the economy from falling into lethargy. Schumpeter quite rightly stressed the entrepreneur's propensity to destroy anything that resembles a stationary equilibrium, for, ultimately, that is what a successful innovation must do. It precludes the economy's actors from surviving tomorrow through mere replication of activities that are entirely viable today. However, as Israel Kirzner has effectively called to our attention (1973), the entrepreneur is equally the enemy of equilibria. For by definition, any disequilibrium must entail some unrealized profit opportunity, and entrepreneurial alertness will restore equilibrium by taking advantage of the opportunity to a degree sufficient to draw off all of the profits it initially offered. That, for example, is the essence of what constitutes true arbitrage among currency-exchange rates that happen to be in disequilibrium.

In sum, the entrepreneur is, by occupation, incapable of leaving matters where they are. If they start off in equilibrium, that state of affairs will be undermined by the entrepreneur's innovative acts; but equally, if the initial state entails disequilibrium, the entrepreneur's alertness will not long permit it to endure.

1.2 A Note on the Origins of the Term

According to Fernand Braudel (1986, vol. 2, p. 329), the term entrepreneur had entered the French language by the beginning of the eighteenth century, but its use was still quite rare. It was not adopted by English-speaking writers until at least the middle of the nineteenth century (though the Oxford English Dictionary cites two fifteenth-century examples of its use in a manner close to its current connotation). Earlier in the nineteenth century it was employed in English to refer to a "director or organizer of musical entertainment" (!).

Richard Cantillon is generally credited as the first to use the term entrepreneur in a work on economics (1755, ch. 13). Cantillon uses the term to refer to merchant wholesalers who bear the risk of reselling agricultural and manufactured produce. Henry Higgs (see Cantillon [1755]) translates the term as undertaker, presumably following Malachy Postlethwayt's Dissertation of 1749, which reproduces extensive portions of the missing original English version of Cantillon's Essai. Probably J. B. Say (1803, 1829) is responsible for popularizing the term. He uses it to denote any organizer of a firm, who is carefully distinguished from the capitalist, that is, the supplier of funds. But Say also places considerable emphasis upon the entrepreneur as an intermediary between the work of the scientist and an industry's workers (e.g., 6th ed., book 1, ch. 6).

Before the word entered the English language, writers would sometimes instead employ the term undertaker, which is, of course, a direct translation of the French term and of its German equivalent—unternehmer—one who undertakes. But the more common, and probably far older, English term is adventurer, as in the fifteenth-century society of overseas merchants in London, the Merchant Adventurers. The term itself can plausibly be interpreted to derive from the comings and goings of the merchants, for as the dictionary suggests, it derives from the Latin or Italian, ad, meaning to, as in to and fro, and venire, to come. One may suspect that the modern interpretation of the term adventurer alludes to the risks and encounters that befell medieval merchants more often than they might have wished. Still, and that is the point of this brief discussion, the word adventurer perhaps continues to capture the subject of this book more effectively than the more humdrum term entrepreneur. It is, indeed, the individual willing to embark on
adventure in pursuit of economic goals who will be the prime focus of our discussion.

1.6 The Entrepreneur in Formal Models

Contrast all this with the entrepreneur's place in formal theory. If one looks for him in the indexes of recent writings on value theory, in neoclassical or activity analysis models of the firm, the references are scanty or, more often, totally absent. Virtually all theoretical firms are entrepreneurless—the prince of Denmark has been expunged from the discussion of *Hamlet*.

It is not difficult to explain the absence. Consider the nature of the generic model of the firm. In its simplest form (and in this respect we shall see that the more complex and more sophisticated models are no better), the theoretical firm must choose among alternative values for a small number of rather well-defined variables: price, output, perhaps advertising outlay, and, occasionally, a few others. In making this choice, management is taken to consider the costs and revenues associated with each candidate set of values, as described by the relevant functional relationships, equations, and inequalities. Explicitly or implicitly, the firm is then taken to perform a mathematical calculation which yields optimal (i.e., profit-maximizing) values for all of its decision variables, and it is these values that the theory assumes to be chosen and that are declared to constitute the company's vector of decisions. There matters rest, forever or until exogenous forces lead to an autonomous change in the environment. Until there is such a shift in one of the relationships that define the problem, the firm is taken to replicate precisely its previous decisions, day after day, year after year.

Clearly, the entrepreneur has been read out of the model. There is no room for enterprise or initiative. The management group becomes a passive calculator that reacts mechanically to changes imposed on it by fortuitous external developments over which it does not exert, and may not even attempt to exert, any influence. One hears of no clever ruses, ingenious schemes, valuable innovations, or any of the other stuff of which outstanding entrepreneurship is made; one does not hear of them because there is no way in which they can fit into the formal optimization model.

What has just been said constitutes no criticism, not even an attempt to reprove mildly the neoclassical model of the firm. That model does what it was designed to do and does it well. Like any respectable analysis, one hopes that it will be modified, amended, and improved with time, but not because it is incapable of handling an issue for which it was not designed. The model is essentially an instrument of optimality analysis of well-defined problems, and it is precisely such (very real and important) problems that need no entrepreneur for their solution.

Some readers may suspect that what are subtly being put forward as more appropriate candidates are alternative models of the firm with which the present author has to some degree been associated. But this is certainly not so, because these modified models are no better for the purpose than the most hidebound of conventional constructs. For example, consider what Oliver Williamson has described as the "managerial discretion models," in which the businessperson is taken to maximize the number of individuals employed, or sales, or still another objective distinct from profits. True, this business director has (somewhere outside the confines of the model) made a choice that was no mere matter of routine arithmetic calculation. She has decided, in at least some sense, to assign priority to some goal other than profit. But having made this choice she becomes, no less than the profit maximizer, a calculating robot, a programmed mechanical component in the automatic system that constitutes the theoretical model of the firm. Her only role is to make and enforce the maximizing decision, and in this the choice of maximand makes no difference.
Nor can the "practical pertinence" of the decision variables make the difference in carving out a place for the entrepreneur. Maximization models have been constructed in which, instead of prices and outputs, the decision variables are the firm's real investment program, its financial mix (the proportion of equity and debt in its funding), or the attributes of a new product to be launched by the company. These decisions seem to smell more of the ingredients of entrepreneurship. But though the models may be powerful and serve their objective well, they take us not a whit further in the analysis of entrepreneurship, for their calculations are again mechanistic and automatic and call for no display of entrepreneurial imagination or initiative.

Finally, it must be made clear that the timeless nature of these models has nothing to do with the problem. G. C. Evans (1924) long ago constructed a model in which the firm considered the consequence of its decisions for the time path of prices, and the calculus of variations served as his instrument of analysis. In other models the firm has been taken to choose not a stationary, once-and-for-all output level, but to select instead an optimal growth rate. None of these alternatives helps matters. In all these models, automaton maximizers the business people are and automaton maximizers they remain.

All this suggests why the body of economic theory, as it has developed, offers no promise of being able to deal effectively with the description and analysis of the entrepreneurial function. For maximization and minimization have constituted the foundation of the theory, and as a result of this very fact the theory cannot provide an analysis of entrepreneurship. The terminology of game theory has been extremely suggestive; the willingness of the behaviorists to break away from traditional formulations has been encouraging; but, at least until recently, there was little sign of breakthroughs in this area. At most, one encountered brilliant observations and descriptive insights such as those provided by Schumpeter and more recently by Harvey Leibenstein, but there was little progress toward a more formal, manipulable engine of calculation and analysis.

One of the main tasks this book undertakes is to see where formal models related to the entrepreneur's activities are applicable and how they can be constructed. This goal will be pursued with the aid of illustrations. Such models make their appearance throughout the book. Some seem quite defensible and illuminating, while others may appear to be rather far-fetched. But even the latter may be justified as suggesting directions for others to follow.

1.3 Is It Possible to Describe (or to Teach) What Entrepreneurs Do?

Since, as interpreted here, an entrepreneurial act must always be at least somewhat different from anything that has been done before, description of such activities going beyond the sort of generalities that have already been offered here may be all but impossible. One can, indeed, describe what entrepreneurs used to do, but simply by virtue of having been reported in detail such an act is transformed into one that is no longer entrepreneurial. I have once suggested that there is a sort of Heisenberg principle that holds for entrepreneurial acts. The very process of describing them can transmute pioneering entrepreneurial undertakings into routine managerial activities. The same problem, of course, besets the schools of business, which would like to be able to train at least some of their students in the ways of the entrepreneur, but which usually succeed in imparting only the skills of the manager. That is accomplishment enough, and certainly calls for no apology; for these schools, like any other entity, find it difficult to achieve the impossible.

It follows from all this that anyone who writes about entrepreneurship has two choices—either to deal with the past, or to discuss something other than the activities that today constitute entrepreneurship. This book employs both these options. Much of its evidence is drawn from historical sources. But the data found there
are not used primarily to discuss the activities that constitute entrepreneurship. Rather, the book centers attention upon the nature of the institutional arrangements that encourage the exercise of entrepreneurship and that provide incentives for it to take productive directions. A bit more will be said on this later in the chapter.

1.4 On the Supply of Entrepreneurship

There is yet another reason why a marriage between theory and policy is not easily arranged in this area. In its discussions of inputs, formal economic analysis deals, by and large, with the way in which these inputs are used, and tells us relatively little about where they come from. In our growth models, for example, the behavior of the labor supply exerts a critical influence on the economy's expansion path. But the determination of the growth of the labor force itself is generally taken to be an exogenous matter. Similarly, in a neoclassical or a programming analysis of production one investigates how inputs should be used in the production process, but one assumes that their supply or their supply function is somehow determined outside the system. Thus, even if we were to design a model that was successful in advancing the theory of entrepreneurship to the level of sophistication of our treatment of other inputs, we would have defined the entrepreneurial role more effectively, but we would have added relatively little to our understanding of the determinants of the level of output of entrepreneurship.

From the point of view of policy, however, the priorities would seem to be reversed. The first order of business for an economy that exhibits very little business drive is presumably to induce the appearance of increased supplies of entrepreneurial skills, which would then be let loose upon the country's economic activity. The policymaker thus is interested primarily in what determines the supply of productive entrepreneurship and in the means that can be used to expand it. But there is reason to suppose that these issues are to a very considerable extent matters of social psychology, social arrangements, cultural developments, and the like. And perhaps this is why many of the recent discussions of the theory of entrepreneurship have been contributed by sociologists and psychologists. This may, then, be no fortuitous development. The very nature of the more pressing issues relating to entrepreneurship may invite more directly the attention of the practitioners of disciplines other than theoretical economics.

1.9 A Place for Theory on Entrepreneurship

Despite these difficulties besetting any attempt to construct a pertinent economic theory in the area, one can still think of theoretical approaches to entrepreneurship which are not without promise. We may not be able to analyze in detail the supply of entrepreneurial ability, the entrepreneur's strategy choices, attitudes to risk, or sources of ideas. But one can hope to examine fruitfully what can be done to encourage productive entrepreneurial activity. Here, an analogy is illuminating. The analysis in Keynes's General Theory seems deliberately to devote little attention to the role of expectations, even though Keynes seems to have believed them to lie at the heart of investment decisions. He apparently downplays the expectations of businesspeople because they elude the influence of systematic government policy. Instead, Keynes's analysis seeks to come to grips with means that can be used by policymakers to stimulate investment; it does so by focusing more directly on the role of interest rates, whose magnitudes may, in some sense, influence investment far less than expectations do, but which are far more dependably amenable to government direction. In the same way, one can undertake to grapple, assisted by theoretical instruments, with policies that evade the highly relevant and very difficult sociological and psychological issues, but that nevertheless hold some promise of being able to encourage the productive exercise of entrepreneurship.
One way in which this can be attempted is to downplay the means that the entrepreneur employs or the process whereby he arrives at his decisions and by emphasizing instead the determinants of the payoff to his activity. Such theoretical analyses can be of considerable significance for policy. For a growth-conscious world, encouragement (in the form of appropriate rewards) of the productive entrepreneur may well prove a key to enhancement of productivity and output. The view that this must await the slow and undependable process of change in the social and psychological climate is a counsel of despair for which there is little justification. Such a conclusion is analogous to an argument that all we can do to reduce spending in an inflationary period is to hope for a revival of the Protestant ethic and the attendant acceptance by the general public of the virtues of thrift. Surely, we have learned to do better than that, by increasing the reward for saving, that is, by producing a movement along the relevant functional paths rather than undertaking the more heroic task involved in shifting the relationships. This is precisely what one can hope to obtain from more careful study of the rewards of entrepreneurship. Without awaiting a change in the strength and prevalence of the entrepreneurial drive exhibited in our society, we can try to learn how one can modify the current system of rewards to stimulate the volume and intensity of entrepreneurial activity and to move it into more productive directions, thus making the most of what is permitted by current mores and attitudes. In following this path, then, we pursue the classical lines of economic analysis, with their emphasis upon the prices (remuneration rates) of inputs as one of the determinants of their allocation and usage.

This book will, in fact, explore a number of hypotheses that can, perhaps charitably, be interpreted as steps toward an expanded theory of the economic role of the entrepreneur, and of the variables that influence her performance. For example, substantial space is devoted to consideration of the part played by the entrepreneur in technology transfer, that is, in the international dissemination of invention, in the term's most general sense. It will be shown that in intercountry transfers of the pertinent skills and knowledge, the source country is itself often also a substantial supplier of the requisite entrepreneurial initiative. That is, the countries that provide the inventions supply not only the ideas and know-how, but often also the free-enterprising exporters of those invaluable properties. The implication for the recipient countries is that, while the availability of indigenous entrepreneurial talent may indeed be highly valuable, it may not be quite as indispensable for the process of getting the recipient, or imitator, country a share of the benefits of the world's advancing technology as has sometimes been thought to be true. In this connection, the book will also explore the hypothesis that such imitation (of an innovation originally produced in another country) plays a critical role in economic growth, that is, in growth in productivity and in output per capita, not only for less developed countries, but even for the world's industrial leaders. It will even be suggested that for a "typical" industrial country the contribution made by technology transfer is likely to be greater in the long run than is that derived from domestic innovation.

Perhaps even more than these, the book will emphasize the hypothesis that readily describable changes in an economy's set of "rules of the game" (which determine the relative returns, in terms of wealth, power, and prestige, that are offered by different lines of activity) can serve to redirect the flow of entrepreneurial effort. Consequently, a change in the economic ground rules can make a difference in whether entrepreneurial efforts take forms that are productive or rent-seeking or are (as can sometimes happen) even directly destructive to the economy. It will be suggested, then, that while encouragement of the supply of entrepreneurs is a suitable goal for policy, the design of measures that channel it into productive directions may merit still higher priority. Such observations, then, with evidence drawn heavily from economic history, will be used to derive inferences both for the design of policy and for the construction of theory.
Though entrepreneurship does not lend itself to garden-variety neoclassical analysis relying on formal maximization calculations, for reasons already emphasized, the divorce between the analysis of entrepreneurial behavior and standard theory is by no means final. If resource allocation theory is as applicable to entrepreneurial inputs as is suggested here, and if the relative rewards offered to this input in the different activities available to it are a critical determinant of its allocation, then much of the standard theoretical apparatus remains pertinent. It is also widely agreed that the entrepreneur's central domain is the growth of the economy. But if the allocation of entrepreneurial effort is a critical component of this process, then the neoclassical allocative mechanism itself breaks out of purely static analysis to a crucial role in the economy's development. The result may be increased unification of the analyses of the static and intertemporal performances of the economy.

In any event, there clearly exists a well-developed body of allocation theory and an armory of analytical weapons available for use in the theory of entrepreneurship. These ways of thinking are implicit in many of the chapters that follow.

1.5 The Entrepreneur as Resource Allocator and as Allocated Resource

The entrepreneur has a two-way relationship with the allocation process. One side of the matter is the entrepreneur's role as allocator of resources. The other side is that entrepreneurial effort itself must be considered an input in the production process, one that may (or may not, as we will see in the next chapter) contribute to the size of the economy's overall output or to its growth. As an input, entrepreneurship, like any other input, can be reallocated from one task to another by a change in the relative profit prospects offered by the available alternative uses to which entrepreneurship can be put. The entrepreneur influences resource allocation when he recognizes disequilibria as opportunities for profitable arbitrage. The neo-Austrians, particularly Israel Kirzner, have recognized this side of the entrepreneur, as the individual who is constantly alert for lacunae in the workings of the market process, which constitute opportunities to earn economic profits through improvements in the allocation of resources.

In turn, the efforts of entrepreneurs are reallocated by shifts in the sectors of the economy and the lines of activity where profit seems most easily to be earned. Perhaps not for all entrepreneurs, but surely for many of them, the identity of the line of endeavor that offers the most promising prospect of profits is no matter of great moment. In describing the logic of his (avowedly) tautological labor theory of value, Marx makes much of the way in which, in a capitalist economy, produced objects lose their concrete character as particular embodiments of use value. [T]he exchange of commodities is evidently an act characterized by total abstraction from use-value ... we see in [a product] no longer a table, a house, yam, or any other useful thing When looked at as crystals of this social substance, common to them all, they are—values (Capital, vol. 1, ch. 1, sec. 1). Thus, in the profit-making production process a chair and a table lose their distinctive attributes as an item upon which one sits and an object upon which food is placed for eating. Rather, both are transformed into abstract embodiments of exchange value—into prospective sources of financial gain—and are in that sense homogenized. The same is true of the alternative occupations available for the efforts of the entrepreneur. All become homogenized into abstract opportunities for the acquisition of wealth, power, or prestige, and the pricing arrangements that determine prospective profitability therefore can have a profound influence on the pattern of allocation of the economy's entrepreneurial resources. We may perhaps say, then, that while the entrepreneurs (help to) run the market mechanism and its pricing process, that market mechanism and its pricing, in turn, (help to) run the entrepreneurs.

Some types of reallocation of entrepreneurial effort are of the sort one is likely to expect, and those require
no comment here. When the development of an industry reaches a stage at which the opportunities for further innovation seem, perhaps temporarily, to be exhausted, it is not surprising to find entrepreneurial effort flowing out of that field and into others where the opportunities for the profitable introduction of change seem brighter. That, after all, is the market mechanism's counterpart to the planning activities of government agencies, such as Japan's Ministry of International Trade and Industry (MITI), which are intended to encourage the reallocation of capital and entrepreneurship into those arenas that offer the most encouraging prospects for growth. The propensity of entrepreneurs to redirect their efforts in this way has long been recognized and its contribution to the dynamism of the economy accepted.

However, sometimes such a relocation is a more questionable step. For example, in a less developed country, a change in the laws that greatly increases the hazards faced by entrepreneurs in directly productive lines of activity may induce them to turn their efforts to activities such as accumulation of land and advance in the government bureaucracy. And that may not just change the directions of the economy's productive efforts, but can reduce its output and impede its growth. This sort of reallocation of entrepreneurial effort, too, can be induced by changes affecting the relative returns to more productive and less productive exercises of entrepreneurship. Such changes are the subject of Chapter 2.

1.11 Some Qualifications on the Schumpeterian Model

It is easy to admire the Schumpeterian model, but that does not obligate us to accept it without modification. It will prove important for the discussion that follows to take note of Nathan Rosenberg's criticisms of the Schumpeterian tradition (which are clearly not intended to detract from that author's respect for Schumpeter's contribution). It is necessary here to note concurrence with those criticisms because several of the lines of discussion in this book grow out of them. Though there is much more to Rosenberg's analysis of the subject for our purposes it can be summed up in three points: first, that Schumpeter's distinction between the roles of the inventor and the innovator is excessively sharp; second, that the same is true of his distinction between innovators and imitators, especially since an entrepreneur often performs all three roles; third, as is emphasized by Rosenberg, innovation is almost always a near-continuous process, proceeding in small steps, each of which contributes to the evolution of a new product or process. The evolutionary process not only gets under way, typically, well before the introduction of the novel item into the market, but usually continues as long as that item remains in use.

There is no question that the innovator and the inventor are often one and the same person; one need only mention Eli Whitney, Thomas Edison, and Edwin Land to provide some of the many available examples. Even where they have not been the same person, they have typically worked together, with the innovator suggesting modifications necessary for the invention in order for it to be viable commercially. Thus, one is misled by the suggestion that the innovator's common procedure is to seek out finished inventions that she can, so to speak, put into her inventory of novel items, to be withdrawn from the warehouse and introduced into the economy at the moment judged to be propitious.

Similarly, imitation is usually not mere reproduction but is, rather, a creative and innovative process so that, as Rosenberg emphasizes, there is often no clear dividing line between acts of imitation and innovation (a point that will also prove important for us in later chapters). This obviously must be so where the predecessor product is protected effectively by patent or secrecy, so that mere copying simply is not a practical option. Aside from that, because the object of even the Schumpeterian imitator is to get back into the race as an effective competitor, that person must seek to provide a product or process that is not merely just as good as the one that appeared earlier; rather, what must be aimed for is something newer and at least
a bit more attractive—having novel features, or costing less, or in some other way differing from the predecessor item. Moreover, where the innovator seeks entree by concentrating upon a group of consumers not previously served, an application not previously recognized, or a geographic market not previously entered, the product will almost certainly require adaptation to the preferences of the new group of consumers, the requirements of the novel application, or the special climatic and other conditions that characterize the new geographic market. All of these adaptations are surely innovative steps, which often improve the product sufficiently to elicit some responsive redesign of the predecessor product.

Finally, Rosenberg takes exception to the view characterizing invention as an instantaneous breakthrough (presumably accompanied by a cry of "Eureka!") constituting a sharp break with anything that was known before. The continuity of the innovation process is equally clear from the evidence. Though particular inventions may undoubtedly entail one or more flashes of inspiration in the course of their development, the actual process of going from underlying idea to saleable product is almost always a time-consuming process, typically entailing a series of small innovative steps before the product can evolve into an item that is commercially viable. Moreover, this process of continual improvement does not normally come to an end when the item arrives on the market. Each invention and innovation is usually just an improvement over some predecessor model, and it is usually succeeded by a series of improved substitutes. Rosenberg provides a profusion of illuminating historical examples (see, e.g., 1976, pp. 66—75, and 1982, pp. 6-8, 62-70).

There is another way to demonstrate the point. If inventions and innovations typically constituted discrete quantum leaps, then patent infringement suits would not be as complex as they are. The patented item would be sufficiently different from any other product to leave no doubt as to whether or not the item against which the complaint has been lodged is essentially the same and is not derived from a common ancestor of both the items in question. In practice, such a hearing is, on the contrary, apt to be incredibly complicated. One defense frequently invoked by the accused party is that the feature of the patented item that is the subject of infringement allegations is an obvious extension of some publicly available "prior art" or that the allegedly infringing product itself was based on such prior art. Under U.S. law, if there was an earlier product or process with a feature sufficiently similar either to the item claimed to be infringing or the one claimed to have been the subject of infringement, then the patent protection that has been invoked by the plaintiff will not hold up. Prior-art disputes in patent infringement cases are difficult to deal with precisely because of the continuity of the invention and innovation processes, which means that there generally do exist earlier items sufficiently similar in their specifications to the product at issue in the lawsuit to require the most painstaking scrutiny entailing laborious reexamination of highly technical details. (For a striking illustration, see the decision of the district court in Polaroid Corporation v. Eastman Kodak Co., October 11, 1985, USPQ, pp. 305-46.) A reading of the pertinent portions of the record in such a case illustrates the fine line that may separate irrelevant prior art from prior art that is sufficiently close to the items at issue to invalidate the claim of infringement.

Rosenberg also suggests that the Schumpeterian discussion tends to attract attention away from the critical role of complementarity among inventions. Here he cites many examples, such as Watt's justly famed improvement of the earlier Newcomen steam engine. As noted, the former became commercially viable only when a process capable of boring a cylinder with sufficient accuracy emerged fortuitously from the mill owned by cannon maker John Wilkinson. Rosenberg also reminds us that while "many household appliances—the vacuum cleaner, clothes-washing machine, dishwashing machine—had made their appearances as early as the 1850s and 1860s . . . " these inventions had to be shelved until the arrival of the
small electric motor made them widely usable (Rosenberg, citing Siegfried Giedion [1982, p. 79 n. 34]).

1.6 On Methodological Orientation: Monism and the Search for Causation

The reader will find this book to be eclectic in the methods it employs. Some chapters rely primarily on the work of economic historians as their factual foundation. Others use rather simple-minded statistical approaches, and still others use the methods of formal theory, though not of a very esoteric or sophisticated variety. However, throughout the book I will adhere undeviatingly to two general principles: first, while this book is required by its very choice of subject to emphasize the role of the entrepreneur in influencing the rate of growth and state of prosperity of an economy, at no time will it be implied that this is the only important determinant, or that it is even necessarily *primus inter pares*; second, at no time will any attempt be made to determine "the causes" of any particular phenomenon.

The book should certainly not be taken to be monistic in its orientation simply because it is devoted to a study of the role of the entrepreneur. Nothing here is meant to deny the importance of other influences upon, say, an economy's rate of productivity growth. Natural resource availability, the education of the population, demographic developments, cultural influences, and other variables all undoubtedly have been of crucial importance. There is no way one can hope to rank their influence relative to that of entrepreneurship, particularly in light of the probable interdependence of entrepreneurial activity and the state of those other variables. There is good reason to believe that entrepreneurship *does* matter, and sometimes, for brevity, it will be convenient to speak as though it were the *only* thing that matters. But no such view will ever be intended.

In seeking to offer some broad conclusions, sometimes on the basis of a wide-ranging set of historical observations, this book attempts something in common with the work of a number of distinguished predecessors (e.g., Rostow [1960], Hicks [1969], North and Thomas [1973], and Olson [1982]). In particular, this volume owes a heavy debt to North and Thomas, and its point of view is not markedly dissimilar from theirs. However, there is one basic difference between the methodological approach of those books and this one. Their objective is to determine causes and explanations for historical events and developments. As North and Thomas put it, "The affluence of western man is a new and unique phenomenon. This book explains that unique historical achievement This book focuses upon what causes economic growth" (pp. 1-2, order of statements changed). My goal here, in contrast, is far more limited. The discussion is concerned, so to speak, only with partial derivatives—with the outcome of pseudocontrolled experiments, in which the value of only one variable is permitted to change at one time. This variable, moreover, even if it is really subject to endogenous influences, is generally treated as though it were exogenously determined and imposed upon the economy by an unidentified outside force. Thus, for example, in Chapter 2 great emphasis is placed upon changes in the economic rules of the game that determine at some particular time and place which of the possible activities of the entrepreneur offers the highest rewards. Those ground rules, clearly, are in fact heavily affected by economic circumstances. But the *ceteris paribus* approach adopted here requires such alterations in the rules to be treated as exogenous.

This book adopts such an orientation because of doubts about the prospects of success for any attempt to determine *the* causes of any complex economic phenomena, such as the Great Depression of the 1930s or the prosperity of Europe during the High Middle Ages. Such developments are too complicated, the influences upon them too many, and the historical evidence too sketchy to *offer* much hope for anything approximating the bulk of the explanation. Physicists and biologists conduct controlled experiments, not because these scientists are averse to explaining all the interdependent relationships simultaneously, but
because they usually judge that to be too difficult an undertaking to have much hope of success. How much more difficult must one judge such an undertaking to be for a complex phenomenon in economic history?