



## Long-Range Planning: Challenge to Management Science

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# LONG-RANGE PLANNING\*<sup>1</sup>

## Challenge to Management Science

PETER F. DRUCKER

This paper attempts to define long-range planning as the organized process of making entrepreneurial decisions. It tries to answer three questions asked by managers and management scientists when they hear the phrase "long-range planning": What long-range planning is and what it is not; why it is needed; and what is needed to do long-range planning. The paper concludes with a brief statement why long-range planning can be considered a major opportunity for, and challenge to, Management Science.

### I

It is easier to define long-range planning by what it is not rather than by what it is. Three things in particular, which it is commonly believed to be it emphatically is not.

1) *First it is not "forecasting"*. It is not masterminding the future, in other words. Any attempt to do so is foolish; human beings can neither predict nor control the future.

If anyone still suffers from the delusion that the ability to forecast-beyond the shortest time span is given to us, let him look at the headlines in yesterday's paper, and then ask himself which of them he could possibly have predicted ten years ago.

Could he have forecast that by today the Russians would have drawn even with us in the most advanced branches of physical sciences and of engineering? Could he have forecast that West Germany in complete ruins and chaos then would have become the most conservative country in the world and one of the most productive ones, let alone that it would become very stable politically? Could he have forecast that the Near East would become a central trouble spot, or would he have had to assume that the oil revenues there would take care of all problems?

This is the way the future always behaves. To try to mastermind it is therefore childish; we can only discredit what we are doing by attempting it. We must start out with the conclusion that forecasting is not respectable and not worthwhile beyond the shortest of periods. *Long-range planning is necessary precisely because we cannot forecast.*

But there is another, and even more compelling reason why forecasting is not long-range planning. Forecasting attempts to find the most probable course of events, or at best, a range of probabilities. But the entrepreneurial problem is the unique event that will change the possibilities, for the entrepreneurial

\* This article is based on a paper given before the Fourth International Meeting of the Institute of Management Sciences, held in Detroit, October 17-18, 1957.

<sup>1</sup> Received August 1958.

universe is not a physical but a value-universe. Indeed the central entrepreneurial contribution and the one which alone is rewarded with a profit, is to bring about the unique event, the *innovation* that changes the probabilities.

Let me give an example—a very elementary one which has nothing to do with innovation but which illustrates the importance of the improbable even for purely adaptive business-behavior.

A large coffee distributor has for many years struggled with the problem of the location and capacity of its processing plants throughout the country. It had long been known that coffee prices were as important a factor in this, as location of market, volume, or transportation and delivery strategy. Now if we can forecast anything, it is single-commodity prices; and the price forecasts of the company economists have been remarkably accurate. Yet the decisions on plant location and capacity based on these forecasts have again and again proven costly blunders. Extreme pricing events, the probability of which at any one time was exceedingly low, had, even if they lasted only for a week at a time, impact on the economics of the system that were vastly greater than that of the accurately forecast “averages”. Forecasting, in other words, obscured economic reality. What was needed (as the Theory of Games could have proven) was to look at the extreme possibilities, and to ask, “which of these can we not afford to disregard?”

The only thing atypical in this example is that it is so simple. Usually things are quite a bit more complex. But despite its (deceptive) simplicity it shows why forecasting is not an adequate basis even for purely adaptive behavior, let alone for the entrepreneurial decisions of long-range planning.

2) The next thing to be said about what long-range planning is not, is that it does not deal with future decisions. It deals with the *futurity of present decisions*.

Decisions exist only in the present. The question that faces the long range planner is not what we should do tomorrow. It is what do we have to do today to be ready for an uncertain tomorrow. The question is not what will happen in the future. It is: what futurity do we have to factor into our present thinking and doing, what time spans do we have to consider, and how do we converge them to a simultaneous decision in the present?

Decision-making is essentially a time machine which synchronizes into one present a great number of divergent time spans. This is, I think, something which we are only learning now. Our approach today still tends toward the making of plans for something we will decide to do in the future. This may be a very entertaining exercise, but it is a futile one.

Again, long-range planning is necessary because we can make decisions only *in the present*; the rest are pious intentions. And yet we cannot make decisions *for the present alone*; the most expedient, most opportunist decision—let alone the decision not to decide—may commit us on a long-range basis, if not permanently and irrevocably.

3) Finally, the most common misconception of all, *long-range planning is not an attempt to eliminate risk*. It is not even an attempt to minimize risk. Indeed any

such attempt can only lead to irrational and unlimited risk and to certain disaster.

The central fact about economic activity is that, by definition, it commits present resources to future and therefore highly uncertain expectations. To take risk is therefore the essence of economic activity. Indeed one of the most rigorous theorems of economics (Boehm-Bawerk's Law) proves that existing means of production will yield greater economic performance only through greater uncertainty, that is, through greater risk.

But while it is futile to try to eliminate risk, and questionable to try to minimize it, it is essential that the risks taken be the *right risks*. The end result of successful long-range planning must be a capacity to take a greater risk; for this is the only way to improve *entrepreneurial* performance. To do this, however, we must know and understand the risks we take. We must be able to rationally choose among risk-taking courses of action rather than plunge into uncertainty on the basis of hunch, hearsay or experience (no matter how meticulously quantified).

Now I think we can attempt to define what long-range planning is. It is the continuous process of making *present entrepreneurial (risk taking) decisions* systematically and with the best possible knowledge of their futurity, organizing systematically *the efforts* needed to carry out these decisions, and measuring the results of these decisions against the expectations through *organized, systematic feed-back*.

## II

"This is all very well," many experienced businessmen might say (and do say). "But why make a production out of it? Isn't this what the entrepreneur has been doing all along, and doing quite successfully? Why then should it need all this elaborate mumbo-jumbo? Why should it be an organized, perhaps even a separate activity? Why in other words, should we even talk about 'long-range planning', let alone do it?"

It is perfectly true that there is nothing very new to entrepreneurial decisions. They have been made as long as we have had entrepreneurs. There is nothing new in here regarding the essentials of economic activity. It has always been the commitment of present resources to future expectations; and for the last three hundred years this has been done in contemplation of change. (This was not true earlier. Earlier economic activity was based on the assumption that there would be no change, which assumption was institutionally guarded and defended. Altogether up to the seventeenth century it was the purpose of all human institutions to prevent change. The business enterprise is a significant and rather amazing novelty in that it is the first human institution having the purpose of bringing about change.)

But there are several things which are new; and they have created the need for the organized, systematic, and above all, specific process that we call "long-range planning".<sup>2</sup>

<sup>2</sup> "Long-range planning" is not a term I like or would have picked myself. It is a misnomer—as are so many of our terms in economics and management, such as "capitalism",

1) The time span of entrepreneurial and managerial decisions has been lengthening so fast and so much as to make necessary systematic exploration of the uncertainty and risk of decisions.

In 1888 or thereabouts, an old and perhaps apocryphical story goes, the great Thomas Edison, already a world figure, went to one of the big banks in New York for a loan on something he was working on. He had plenty of collateral and he was a great man; so the vice-presidents all bowed and said "Certainly, Mr. Edison, how much do you need?" But one of them, out of idle curiosity asked, "Tell me, Mr. Edison, how long will it be before you have this new product?" Edison looked him in the eye and said, "Son, judging from past experience, it will be about eighteen months before I even know whether I'll have a product or not." Whereupon the vice-presidents collapsed in a body, and, despite the collateral, turned down the loan application. The man was obviously mad; eighteen months of uncertainty was surely not a risk a sane businessman would take!

Today practically every manager takes ten or twenty year risks without wincing. He takes them in product development, in research, in market development, in the development of a sales organization, and in almost anything. This lengthening of the time span of commitment is one of the most significant features of our age. It underlies our economic advances. But while quantitative in itself, it has changed the qualitative character of entrepreneurial decisions. It has, so to speak, converted time from being a dimension in which business decisions are being made into an essential element of the decisions themselves.

2) Another new feature is the speed and risk of innovation. To define what we mean by this term would go far beyond the scope of this paper.<sup>3</sup>

But we do not need to know more than that industrial research expenditures (that is, business expenditures aimed at innovating primarily peacetime products and processes) have increased in this country from less than \$100 million in 1928 to \$7 or 8 billion in 1958. Clearly, a technologically slow-moving, if not essentially stable economy has become one of violent technological flux, rapid obsolescence and great uncertainty.

3) Then there is the growing complexity both of the business enterprise internally, and of the economy and society in which it exists. There is the growing specialization of work which creates increasing need for common vision, common understanding, and common language, without which top management decisions, however right, will never become effective action.

4) Finally—a subtle, but perhaps the most important point—the typical businessman's concept of the basis of entrepreneurial decision is, after all, a misconception.

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"automation", "operations research", "industrial engineering", or "depreciation". But it is too late to do anything about the term; it has become common usage.

<sup>3</sup> For a discussion see my new book "*The Landmarks of Tomorrow*" (Harper and Brothers, New York, 1958).

Most businessmen still believe that these decisions are made by "top management". Indeed practically all text books lay down the dictum that "basic policy decisions" are the "prerogative of top management". At most, top management "delegates" certain decisions.

But this reflects yesterday's rather than today's reality, let alone that of tomorrow. It is perfectly true that top management must have the final say, the final responsibility. But the business enterprise of today is no longer an organization in which there are a handful of "bosses" at the top who make all the decisions while the "workers" carry out orders. It is primarily an organization<sup>4</sup> of professionals of highly, specialized, knowledge exercising autonomous, responsible judgement. And every one of them—whether manager or individual expert contributor—constantly makes truly entrepreneurial decisions, that is, decisions which affect the economic characteristics and risks of the entire enterprise. He makes them not by "delegation from above" but inevitably in the performance of his own job and work.

For this organization to be functioning, two things are needed: knowledge by the entire organization what the direction, the goals, the expectations are; and knowledge by top management of what the decisions, commitments, and efforts of the people in the organization are. The needed focus—one might call it a *model of the relevant in internal and external environment*—only a "long-range plan" can provide.

One way to summarize what is new and different in the process of entrepreneurial decision-making is in terms of information. The amount, diversity, and ambiguity of the information that is beating in on the decision-maker have all been increasing so much that the built-in experience reaction that a good manager has cannot handle it. He breaks down; and his breakdown will take either of the two forms known to any experimental psychologists. One is withdrawal from reality, i.e., "I know what I know and I only go by it; the rest is quite irrelevant and I won't even look at it". Or there is a feeling that the universe has become completely irrational so that one decision is as good as the other, resulting in paralysis. We see both in executives who have to make decisions today. Neither is likely to result in rational or in successful decisions.

There is something else managers and management scientists might learn from the psychologists. Organization of information is often more important to the ability to perceive and act than analysis and understanding of the information. I recall one experience with the organization of research-planning in a pharmaceutical company. The attempt to analyze the research decisions—even to define alternatives of decisions—was a dismal failure. In the attempt, however, the decisions were classified to the point where the research people could know what kind of a decision was possible at what stage. They still did not know what factors should or should not be considered in a given decision, nor what its risks were. They could not explain why they made this decision

<sup>4</sup> For a discussion of this "new organization" see again my "*The Landmarks of Tomorrow*" mentioned above.

rather than another one, nor spell out what they expected. But the mere organization of this information enabled them again to apply their experience and to “play hunches”—with measurable and very significant improvement in the performance of the entire research group.

“Long-range planning” is more than organization and analysis of information; it is a decision-making process. But even the information job cannot be done except as part of an organized planning effort—otherwise there is no way of determining which information is relevant.

### III

What then are the requirements of long-range planning? We cannot satisfy all of them as yet with any degree of competence; but we can specify them.

Indeed, we can—and should—give two sets of specifications: One in terms of the characteristics of the process itself; another in terms of its major and specific new-knowledge content.

1) Risk-taking entrepreneurial decisions, no matter whether made rationally or by tea-leaf reading, always embody the same eight elements:

a. *Objectives*. This is, admittedly, an elusive term, perhaps even a metaphysical one. It may be as difficult for Management Science to define “objectives” as it is for biology to define “life”. Yet, we will be as unable to do without “objectives” as the biologists are unable to do without “life”. Any entrepreneurial decision, let alone the integrated decision-system we call a “long-range plan”, has objectives, consciously or not.

b. *Assumptions*. These are what is believed by the people who make and carry out decisions to be “real” in the internal and external universe of the business.

c. *Expectations*,—the future events or results considered likely or attainable.

These three elements can be said to *define the decision*.

d. *Alternative courses of action*. There never is—indeed, in a true uncertainty situation there never can be—“one right decision”. There cannot even be “one best decision”. There are always “wrong decisions”, that is, decisions inadequate to the objectives, incompatible with the assumptions, or grossly improbable in the light of the expectations. But once these have been eliminated, there will still be alternatives left—each a different configuration of objectives, assumptions and expectations, each with its own risks and its own ratio between risks and rewards, each with its own impact, its specific efforts and its own results. Every decision is thus a value-judgment—it is not the “facts that decide”; people have to choose between imperfect alternatives on the basis of uncertain knowledge and fragmentary understanding.

Two alternatives deserve special mention, if only because they have to be considered in almost every case. One is the alternative of no action (which is, of course, what postponing a decision often amounts to); the other is the very important choice between adaptive and innovating action—each having risks that differ greatly in character though not necessarily in magnitude.

e. The next element in the decision-making process is the *decision itself*.

f. But there is no such thing as one isolated decision; every decision is, of necessity, part of a *decision-structure*.

Every financial man knows, for instance, that the original capital appropriation on a new investment implies a commitment to future- and usually larger-capital appropriations which, however, are almost never as much as mentioned in the proposal submitted. Few of them seem to realize, however, that this implies not only a positive commitment but also, by mortgaging future capital resources, limits future freedom of action. The structuring impact of a decision is even greater in respect to allocations of scarce manpower, such as research people.

g. A decision is only pious intention unless it leads to action. Every decision, therefore, has an *impact stage*.

This impact always follows Newton's Second Law, so to speak; it consists of action and reaction. It requires effort. But it also dislocates. There is, therefore, always the question: what effort is required, by whom, and where? What must people know, what must they do and what must they achieve? But there is also the question—generally neglected—what does this decision do to other areas? Where does it shift the burden, the weaknesses, and the stress points; and what impact does it have on the outside; in the market, in the supply structure, in the community, and so on.

h. And, finally, there are *results*.

Each of these elements of the process deserves an entire book by itself. But I think I have said enough to show that both, the process itself and each element in it, are *rational*, no matter how irrational and arbitrary they may appear. Both the process and all its elements can therefore be defined, can be studied and can be analyzed. And both can be improved through systematic and organized work. In particular, as in all rational processes, the entire process is improved and strengthened as we define, clarify and analyze each of its constituent elements.

2) We can also, as said above, describe long-range planning in terms of its specific new-knowledge content.

Among the areas where such new knowledge is particularly cogent, might be mentioned:

a. *The time dimensions of planning.*

To say "long-range" or "short-range" planning implies that a given time span defines the planning; and this is actually how businesses look at it when they speak of a "five-year plan" or a "ten-year plan". But the essence of planning is to make present decisions with knowledge of their futurity. It is the futurity that determines the time span, and not vice versa.

Strictly speaking, "short range" and "long range" do not describe time spans but stages in every decision. "Short-range" is the stage before the decision has become fully effective, the stage during which it is only "costs" and not yet "results". The "short range" of a decision to build a steel mill are the five years or so until the mill is in production. And the "long-range" of any decision is the period of expected performance needed to make the decision a



successful one—the twenty or more years above break-even point operations in the case of the steel mill, for instance.

There are limitations on futurity. In business decisions the most precise mathematical statement is often that of my eighth grade teacher that parallels are two lines which do not meet this side of the school yard. Certainly, in the expectations and anticipations of a business the old rule of statistics usually applies that anything beyond twenty years equals infinity; and since expectations more than twenty years hence have normally a present value of zero, they should receive normally only a minimal allocation of present efforts and resources.

Yet it is also true that, if future results require a long gestation period, they will be obtained only if initiated early enough. Hence, long-range planning requires knowledge of futurity: what do we have to do today if we want to be some place in the future? What will not get done at all if we do not commit resources to it today?

If we know that it takes ninety-nine years to grow Douglas firs in the Northwest to pulping size, planting seedlings today is the only way we can provide for pulp supply in ninety-nine years. Some one may well develop some speeding-up hormone; but we cannot bank on it if we are in the paper industry. It is quite conceivable, may indeed be highly probable, that we will use trees primarily as a source of chemicals long before these trees grow to maturity. We may even get the bulk of paper supply thirty years hence from less precious, less highly structured sources of cellulose than a tree, which is the most advanced chemical factory in the plant kingdom. This simply means, however, that our forests may put us into the chemical industry some time within the next thirty years; and we had better learn now something about chemistry. If our paper plants depend on Douglas fir, our planning cannot confine itself to twenty years, but must consider ninety-nine years. For we must be able to say whether we have to plant trees today, or whether we can postpone this expensive job.

But on other decisions even five years would be absurdly long. If our business is buying up distress merchandise and selling it at auction, then next week's clearance sale is "long range future"; and anything beyond is largely irrelevant to us.

It is the nature of the business and the nature of the decision which determine the time-spans of planning.

Yet the time spans are not static or "given". The time decision itself is the first and a highly important risk-taking decision in the planning process. It largely determines the allocation of resources and efforts. It largely determines the risks taken (and one cannot repeat too often that to postpone a decision is in itself a risk-taking and often irrevocable decision). Indeed, the time decision largely determines the character and nature of the business.

*b. Decision structure and configuration.*

The problem of the time dimension is closely tied in with that of decision structure.

Underlying the whole concept of long-range planning are two simple insights.

We need an integrated decision structure for the business as a whole. There are really no isolated decisions on a product, or on markets, or on people. Each major risk-taking decision has impact throughout the whole; and no decision is isolated in time. Every decision is a move in a chess game, except that the rules of enterprise are by no means as clearly defined. There is no finite "board" and the pieces are neither as neatly distinguished nor as few in number. Every move opens some future opportunities for decision, and forecloses others. Every move, therefore, commits positively and negatively.

Let me illustrate these insights with a simple example, that of a major steel company today.

I posit that it is reasonably clear to any student of technology (not of steel technology but of technology in general) that steelmaking is on the threshold of major technological change. *What* they are perhaps the steelmaker knows, but *that* they are I think any study of the pattern, rhythm, and I would say morphology of technological development, might indicate. A logical—rather than metallurgical—analysis of the process would even indicate *where* the changes are likely to occur. At the same time, the steel company faces the need of building new capacity if it wants to keep its share of the market, assuming that steel consumption will continue to increase. A decision to build a plant today, when there is nothing but the old technology available, means in effect that for fifteen to twenty years the company cannot go into the new technology except at prohibitive cost. It is very unlikely, looking at the technological pattern, that these changes will be satisfied by minor modifications in existing facilities; they are likely to require new facilities to a large extent. By building today the company closes certain opportunities to itself, or at least it very greatly raises the future entrance price. At the same time, by making the decision to postpone building, it may foreclose other opportunities such as market position, perhaps irrevocably. Management therefore has to understand—without perhaps too much detail—the location of this decision in the continuing process of entrepreneurial decision.

At the same time, entrepreneurial decisions must be fundamentally expedient decisions. It is not only impossible to know all the contingent effects of a decision, even for the shortest time period ahead. The very attempt to know them would lead to complete paralysis.

But the determination what should be considered and what should be ignored, is in itself a difficult and consequential decision. We need knowledge to make it—I might say that we need a theory of entrepreneurial inference.

*c. The characteristics of risks.*

It is not only magnitude of risk that we need to be able to appraise in entrepreneurial decisions. It is above all the character of the risk. Is it, for instance, the kind of risk we can afford to take, or the kind of risk we cannot afford to take? Or is it that rare but singularly important risk, the risk we cannot afford not to take—sometimes regardless of the odds?

The best General Electric scientists, we are told, advised their management in 1945 that it would be at least forty years before nuclear energy could be

used to produce electric power commercially. Yet General Electric—rightly—decided that it had to get into the atomic energy field. It could not afford not to take the risk as long as there was the remotest possibility that atomic energy would, after all, become a feasible source of electric power.

We know from experience that the risk we cannot afford not to take, is like a “high-low” poker game. A middle hand will inevitably lose out. But we do not know why this is so. And the other, and much more common kinds of risk we do not really understand at all.

*d. Finally, there is the area of measurements.*

I do not have to explain to readers of *Management Science* why measurements are needed in management, and especially for the organized entrepreneurial decisions we call “long range planning”.

But it should be said that in human institutions, such as a business enterprise, measurements, strictly speaking, do not and cannot exist. It is the definition of a measurement that it be impersonal and objective, that is, extraneous to the event measured. A child’s growth is not dependent on the yardstick or influenced by being recorded. But any measurement in a business enterprise determines action—both on the part of the measurer and the measured—and thereby directs, limits and causes behavior and performance of the enterprise. Measurement in the enterprise is always motivation, that is, moral force, as much as it is *ratio cognoscendi*.

In addition, in long-range planning we do not deal with observable events. We deal with future events, that is with expectations. And expectations, being incapable of being observed, are never “facts” and cannot be measured.

Measurements, in long-range planning, thus present very real problems, especially conceptual ones. Yet precisely because what we measure and how we measure determines what will be considered relevant, and determines thereby not just what we see, but what we—and others—do, measurements are all-important in the planning process. Above all, unless we build expectations into the planning decision in such a way that we can very early realize whether they are actually fulfilled or not—including a fair understanding of what are significant deviations both in time and in scale—we cannot plan; and we have no feedback, no way of self-control in management.

We obviously also need for long-range planning *managerial* knowledge—the knowledge with respect to the operations of a business. We need such knowledge as that of the resources available, especially the human resources; their capacities and their limitations. We need to know how to “translate” from business needs, business results and business decisions into functional capacity and specialized effort. There is, after all, no functional decision, there is not even functional data, just as there is no functional profit, no functional loss, no functional investment, no functional risk, no functional customer, no functional product and no functional image of a company. There is only a unified company product, risk, investment and so on, hence only company performance and company results. Yet at the same time the work obviously has to be done by people each of whom has to be specialized. Hence for a decision to be possible, we must be able to

integrate divergent individual knowledges and capacities into one organization potential; and for a decision to be effective, we must be able to translate it into a diversity of individual and expert, yet focused efforts.

There are also big problems of knowledge in the entrepreneurial task that I have not mentioned—the problems of growth and change, for instance, or those of the moral values of a society and their meaning to business. But these are problems that exist for many areas and disciplines other than management.

And in this paper I have confined myself intentionally to knowledge that is specific to the process of long-range planning. Even so I have barely mentioned the main areas. But I think I have said enough to substantiate three conclusions:

a) Here are areas of genuine knowledge, not just areas in which we need data. What we need above all, are basic theory and conceptual thinking.

b) The knowledge we need is new knowledge. It is not to be found in the traditional disciplines of business such as accounting or economics. It is also not available, by and large, in the physical or life sciences. From the existing disciplines we can get a great deal of help, of course, especially in tools and techniques. And we need all we can get. But the knowledge we need is distinct and specific. It pertains not to the physical, the biological or the psychological universe, though it partakes of them all. It pertains to the specific institution, the enterprise, which is a social institution existing in contemplation of human values. What is “knowledge” in respect to this institution let alone what is “scientific” must therefore always be determined by reference to the nature, function and purposes of this specific (and very peculiar) institution.

c). It is not within the decision of the entrepreneur whether he wants to make risk-taking decisions with long futurity; he makes them by definition. All that is within his power is to decide whether he wants to make them responsibly or irresponsibly, with a rational chance of effectiveness and success, or as blind gamble against all odds. And both, because the process is essentially a rational process, and because the effectiveness of the entrepreneurial decisions depends on the understanding and voluntary efforts of others, the process will be the more responsible and the more likely to be effective, the more it is a rational, organized process based on knowledge.

#### IV

Long-range planning is risk-taking decision making. As such it is the responsibility of the policy-maker, whether we call him entrepreneur or manager. To do the job rationally and systematically does not change this. Long-range planning does not “substitute facts for judgment”, does not “substitute science for the manager”. It does not even lessen the importance and role of managerial ability, courage, experience, intuition, or even hunch—just as scientific biology and systematic medicine have not lessened the importance of these qualities in the individual physician. On the contrary, the systematic organization of the planning job and the supply of knowledge to it, should make more effective individual managerial qualities of personality and vision.

But at the same time long-range planning offers major opportunity and major challenge to Management Science and to the Management Scientist.<sup>5</sup> We need systematic study of the process itself and of every one of its elements. We need systematic work in a number of big areas of new knowledge—at least we need to know enough to organize our ignorance.

At the same time, long-range planning is the crucial area; it deals with the decisions which, in the last analysis, determine the character and the survival of the enterprise.

So far, it must be said, Management Science has not made much contribution to long-range planning. Sometimes one wonders whether those who call themselves “Management Scientists” are even aware of the risk-taking character of economic activity and of the resultant entrepreneurial job of long-range planning. Yet, in the long run, Management Science and Management Scientists may well, and justly, be judged by their ability to supply the knowledge and thinking needed to make long-range planning possible, simple, and effective.

<sup>5</sup> I would like to say here that I do not believe that the world is divided into “managers” and “management scientists”. One man may well be both. Certainly, management scientists must understand the work and job of the manager, and vice versa. But conceptually and as a kind of work, the two are distinct.