# Problem Solving and Marketing Science

by

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Wroe Alderson began his career in marketing in the U.S. Department of Commerce under Herbert Hoover and continued it at the Curtis Publishing Company under Charles Coolidge Parlin. He set up his own research and consulting organization in 1944 and formed a partnership with Robert E. Sessions in 1945.

In addition to serving many clients in the past ten years he has participated in the effort to derive a theoretical perspective for marketing from the general science of human behavior. Among the books to which he has contributed are two which were published under the sponsorship of the American Marketing Association, "Theory in Marketing" and "Marketing Channels for Manufactured Goods." He has received awards for several of his studies and papers and in 1953 was named to the Hall of Fame in Distribution.

He received the Parlin Memorial Award in 1954 together with Donald M. Hobart, vice president and director of the Curtis Publishing Company. Both are past presidents of the American Marketing Association.

## Problem Solving and Marketing Science

The modern analytical approach to marketing sprang from the growing urgency of management problems early in the Twentieth Century. The size and specialization of production units had increased. Products were being sold through more complex distribution channels as producers became more remote from the ultimate consumer. The whole economy had been caught up by accelerating currents of change in consumer requirements and industrial, technology. Marketing executives recognized the need for more systematic procedures in problem solving. The appointment of Charles Coolidge Parlin to study markets for the Curtis Publishing Company was one of the first landmarks along the way.

The concentration of the market analyst on individual problems at first led to skepticism about the contribution of theory. What had previously passed as the science of markets seemed to have little application to crucial marketing decisions. There were more promising places to start than economic theory in determining whether to bring out a new product and what media to use in advertising it. Some of the tools of science such as probability sampling were gradually adopted as standard practice in marketing research. Insights derived from psychology and other fields concerned with human behavior were utilized with increasing frequency. The American Marketing Association embraced as its goal the advancement of science in marketing. Yet marketing practice continued to be the collection and analysis of facts in relation to particular problems. There was little evidence of the interchange of fact with a recognized body of theory which characterized science in other fields.

Beginning about ten years ago there has been a conscious movement to bring theory and practice together. On one side was the need for a theoretical framework for the student of marketing which was more valid for a modern technological economy. On the other side was the demand for a broader perspective for marketing practice. The establishment of the Parlin Memorial Lecture in 1945 was one expression of this effort to lay down new foundations for a science of marketing.

As one of the recipients of the Parlin Award in 1954 it is my purpose to present a program for the advancement of marketing science which arises from deep convictions about the nature of science. This view of science is the pragmatic or functionalist view that science is an instrument for effectuating human purposes. Pure science, no less than applied science, is dedicated to problem solving but at a higher level of generality. Marketing has enjoyed no endowments for contemplative study but has had to pay its own way from the first in practical results. From the functionalist viewpoint this problem orientation is a great advantage of marketing as one of the phases of a general science of human behavior.

For the functionalist there are two main lines of advance toward a science of marketing. The first stems from the recognition that both buyers and sellers come into the market to solve problems. Hence problem solving behavior is the basic subject of study in marketing science. Psychology, sociology, and anthropology, as they move toward an integrated science of human behavior, give greater prominence to the functionalist viewpoint. The second main line of advance is toward a steady improvement in problem solving as a systematic process. On this more deductive side of marketing science the related disciplines include symbolic logic, economic theory, and now operations research.

This lecture will attempt to deal with only the first of these two aspects of marketing science, namely, the study of problems solving behavior in the market place. The logical analysis of the problem solving process directed toward its improvement has been discussed in other papers. Among these are

"How to Solve Marketing Problems,"[1] "The Theory of Puzzles and Problem Solving,"[2] and "Operations Research and Management Problems."[3]

The discussion of marketing science which follows is divided into three sections. The first introduces some of the key concepts of functionalism. The other sections apply these concepts to a theory of consumer behavior and to a theory of competition among sellers. The lecture proceeds on the assumption that it is necessary to be more theoretical in marketing in order to be more practical. Out of a broader science can come both generalizations about market behavior and improved analytical techniques for application to particular problems of marketing management.

## The Functionalist View of Market Behavior

The sciences of human behavior are concerned with the adjustment of individuals or social groups within their material and cultural environments. Functionalism starts with the goals of behavior in trying to understand the processes of adjustment. What are the purposes or objectives of those who enter the market place and how do they behave in trying to carry out these objectives? There are some concepts and guiding principles applying to all forms of adjustment which provide an essential background for the subsequent discussion of market behavior.

Structure and function are key concepts in the social sciences and a great deal turns on the relation between them. This is not the place to explore all of their ramifications but the importance of the issue can be illustrated from the history of economics. The difficulties of developing marketing theory as a phase of economics may be illuminated thereby. One dominant trend of economic thought has tended to take structure for granted and thus to ignore or eliminate it as a theoretical problem. Markets were organized, or at least ought to be organized, on the basis of pure competition. Rational action on the part of either the buyer or seller began with an acceptance of the mandate of a market-determined price. In such a competitive system the wise use of resources in pursuing the aims of the firm resulted in the optimum allocation of resources for the economy as a whole.

In opposition to this belief in automatic adjustment within an ideal system there arose a group of economists who called themselves institutionalists. They were preoccupied with structure as the other group had ignored it. They saw economic development as the movement from one set of institutions to another, structures evolving according to laws of their own and with a very limited sphere for rational action. Economic Man, applying faultless judgment to a perfect knowledge of the market, was replaced by a creature of habit and impulse in the grip of irresistible historic forces.

When marketing men have identified themselves with institutionalism they have apparently interpreted the term in a more restricted sense. It is true that marketing is necessarily concerned with institutional structures such as distribution channels. Every market investigator is bound to admit that there are irrational elements in market behavior. He recognizes and attempts to cope with change and is bound to find a theory of static equilibrium unsatisfactory for that purpose. The underlying assumption that structure usually determines function rather than the reverse does not come naturally to the marketing

[1] *Cost and Profit Outlook*, August 1953.

[2] Marketing Theory Seminar. Dartmouth College. August 1953.

[3] *Cost and Profit Outlook*, December 1953. See also "A Systematics for Problems of Action," *Philosophy of Science*, January 1951.

specialist. Much of marketing practice can fairly be described as the creation or modification of marketing structures to adapt them more closely to the requirements of marketing functions.

The functionalist is in accord with orthodox economic theory in his emphasis upon the pursuit of rational objectives within an economy which has some of the characteristics of a closed operating system. He is not able to take all of the salient features of this working system as given. His professional assignments are directed toward making it work better for some product or in some aspect of its operation. He tries to develop a program of market adjustment for the executive who retains him but it is obviously not the automatic adjustment of pure theory.

The beginning of wisdom for the problem-solver is to recognize that others in the market are solving problems too. That means that they are not merely functioning in an automatic way but are taking steps which make better functioning possible. Due care should be exercised not to carry this viewpoint to the extreme. Much of the routine of marketing activity does proceed in a semi-automatic way. Biology teaches that life could not go on if every aspect of life was constantly in a state of crisis. Every organism has built-in mechanisms for maintaining internal equilibrium without emergency action. The body temperature of 98.6 degrees and the level of saline saturation in the blood are constants maintained by automatic adjustment. A deviation either way activates a feedback circuit which produces a corrective action. Biologists call this tendency to maintain balance "homeostasis." This term has been borrowed by social scientists and applied to operating systems.[4]

The functionalist is interested in both homeostasis and problem solving as forms of social adjustment. They might be compared to two aspects of driving an automobile. Part of the time the driver is simply holding the steering wheel steady to keep the car on the road. At other times he has to make decisions as the car approaches a fork in the road. These two types of adjustment go on in all types of operating units including households and sales organizations. Management is concerned with both control of an operating system and with changes in structure which are necessary to make a working system effective. The act of completing an operating circuit is designated here as "closure." The meaning of closure will be discussed briefly after first commenting on two other aspects of operating systems.

The drive behind any operating system is the expectations of those who participate in it. A system may act as if it had goals of its own but only because it is the instrument for effectuating the goals of individuals. Each enters into joint action because of formal or implied commitments as to the benefits which will be obtained and the resources available for use. The concept of expectations has many facets in marketing management. It applies to relations between the sales executive and his staff as well as to those of the sales organization to its customers.

In marketing as in all other human activities expectations are subject to uncertainty. Rational man acts on the basis of his best guess as to what will happen since he cannot have certain knowledge of the future. Sometimes uncertainty is so great as to present a bar to action. Con fronted with two or more alternative courses of action the marketing executive or the household buyer may suffer grave doubt as to

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[4] "Survival and Adjustment in Organized Behavior Systems," a chapter in *Theory in Market*ing. Richard D. Irwin Publishing Co. 1950.

which to take. One way of saying what it means to solve a problem is to reduce uncertainty to the point where it is possible to choose among alternatives with some confidence in the outcome.

Returning now to the concept of closure it provides the basis for another definition of problem solving. To solve an operating problem is to accomplish closure in an operating system. Whether closure has been achieved is usually only revealed by the attempt to proceed with action. Hence decision is made on the assumed probability of closure. That is another way of saying that uncertainty has been reduced to tolerable limits.

Closure in a marketing system sometimes means completing the informational circuits which are necessary to put the system under control. An example of such a feedback is a continuing study of consumer response to advertising. There are other types of deficiency in an operating system which have to be remedied in order for the system to operate. In marketing the weak links in the chain may be salesmen, dealers, distributors, physical handling facilities, or remedial features of the product, the package, or the promotional program.

From some points of view the active agent who is trying to operate the system is also part of the system. The problem of closure may arise from some flaw in his relations to the rest of the system. He may be confused about how to use the available means because the situation confronting him is too complex to be understood immediately. He may be uncertain as to the relative importance of objectives or he may be in conflict with some of his associates whose objectives are not identical. Thus closure in these terms may mean that the executive needs to be clear in his own mind as to the significant structure of the operating situation or as to what he really hopes and expects to be the outcome of the operation.

The rational being who strives to achieve his objectives through action must always be concerned about an overriding objective which is essential to everything else. In order to act he must have the power to act. All rational decision in an operating system is subject to the power principle. Stated as a precept it is "Act in such a way as to maintain the power to act." In assuming risks concerning the future of the system, there is usually an attempt to guarantee its perpetuation. The most glowing prospect for profit at some future date is not attractive if it involved too great a risk of bankruptcy before the prospect can be realized. All business investments and all consumer purchases tend to obey the power principle. In what is done today there is a large element of getting ready for what must be done tomorrow.

One manifestation of the power principle is the general concern for occupational status or social standing. The worker cannot earn money without being employed or spend it in the way that is most congenial to him unless he is accepted by preferred membership groups. The marketing executive, for directly parallel reasons, is always concerned about the market position of his company. It is idle to talk about maximizing profits unless he first can be sure of a place to stand.

The accumulation of assets by a business or of goods by a household is also an effort to be prepared to act. Goods have the potentiality of supporting a desired pattern of future behavior. Purchases are guided by the buyer's best estimate of requirements which in turn is based on his judgment as to the functions he will have to perform. He replenishes or extends a stock or assortment of goods in relation to these expectations. Any new acquisition is valuable to the extent that it adds to the potency of the assortment, its capacity for meeting probable future requirements.

The term "sorting" has been used in other papers to characterize some basic aspects of the marketing process.[5] This rearrangement or reassignment of stocks of goods takes four forms according to whether a stock is built up or broken down and whether it is homogeneous or diversified in character. Economists have emphasized allocation or the breaking down of a homogeneous supply into smaller quantities, each destined for a specific use. The emphasis here is on the precisely opposite form of sorting which may be called "assorting." That is building up diversified stocks or assortments guided by the overriding objective of promoting the power to act but embracing many sub-objectives. There are psychological implications here which perhaps are not readily suggested by the root term of sorting.

In concluding this introductory section a further word is in order about the term "functionalism" which perhaps means different things to different people. It may seem presumptuous to bracket as functionalists most of those who have been interested in marketing theory and then to set forth a whole series of special concepts as characteristic of this viewpoint. Actually most of these notions are by now quite familiar in economics and marketing. The personal element in the viewpoint set forth is largely centered in the concepts of closure and assorting and in the formulation of the power principle. The problem solving approach to basic science is not new but was enunciated years ago by men who were not so close to practical affairs as the marketing profession. It continues to be one of the fundamental alternative views as to the nature of science.

Whether the problem solving approach in its present version can really contribute to the advancement of marketing science may be judged by what follows. An effort will be made to sketch both a theory of consumer demand and a theory of competition in functionalist terms. It is hoped that this treatment may contribute to a new perspective on the behavior of both buyer and seller in the market place.

## Consumer Behavior as Problem Solving

Buyers, no less than sellers, come into the market to solve problems. That fact may be obscured for those who assume that the consumer operates at an elementary level as compared to either the seller or the industrial buyer. That assumption misses the significance of the technology of household operation and consumption, often an area of ignorance for those technically trained in their own specializations. Even the market analyst who spends his life studying consumer behavior can only hope to report on these changing patterns of activity as they become pertinent to one problem or another.

Investigation of consumer behavior often reveals the inertia of habit and other irrational factors but it also gives evidence of skill and energy applied to consumer problems. To the competent consumer buyer habit and impulse as manifested either by herself or other members of the household are part of the problem. The seller who is interested in consumer motivation would be making a mistake to proceed as if his job were the manipulation of ignorant and unwary consumers. The view of consumer buying presented here has been summarized in other papers and of course anticipated in some of its major

[5] "Scope and Place of Wholesaling in the United States," *Journal of Marketing,* September 1949. Also, "Progress in the Theory of Marketing," *Changing Perspectives in Marketing.* Hugh G. Wales, Editor. University of Illinois Press, 1951.

features by past developments in marketing and economics.[6] It resembles at crucial points the analysis of demand by the Austrian school of economists and particularly Böhm-Bawerk.

Among the key concepts for this view are the maintenance of consumer stocks of goods and uncertainty as to expected values. The purchasing agent for the household replenishes or extends a stock of goods as needed for probable future behavior. In preparing to meet future contingencies the consumer buyer, like the business man, is acting on the power principle. Again, as in executive decision, a decision to buy involves risk. The consumer buyer cannot know with precision what future requirements will be but acts on the basis of an estimate of these requirements at the time of purchase. The degree of risk varies with the amount of money involved and with the period of time over which the item is to be used. Buying a product involves the risk that the anticipated need may never arise in such a way that the product is fully utilized. Refusing to buy involves the risk of being caught unprepared in case of need.

Studies of consumer shopping behavior reveal several facets of uncertainty in the market place. The shopper is engaged in sequential sampling of the available sources of supply. A shopping tour is not a random walk but is guided by the shopper's estimate of the relative probabilities of getting the item wanted at any given store. If the item is not in universal distribution the consumer first tries to find one or more stores which have it and secondly the store which is offering the best deal on it. In some cases there may be doubt whether the item is in the market at all and even as to whether it has actually been produced in the precise form that is demanded. Finally there may be lingering doubts in the background as to whether the product really is a solution to the problem for which it is recommended and whether it will be regarded as such by other members of the household.

The household is subject to conflict and tension like other forms of organization. Different members of the household may have an immediate sense of urgency about entirely different future contingencies. There may be no agreement as to basic family aims or what is regarded as getting ahead in life. Serious conflict affecting purchases can also arise in the mind of a single individual. The buyer may be unable to make a clear choice between objectives which appear mutually exclusive because of budgetary limitations or for other reasons. Impulsive purchases appear to be motivated at times by the need to escape from doubt or to take a position in the struggle of wills with another member of the household. Very often conflict is resolved by more rational means, such as planning, budgeting, and joint shopping.

The consideration of uncertainties facing the buyer provides the basis for a suggested extension of value theory which may throw some problems of modern marketing into a new perspective. An earlier school of economics credited the consumer buyer with balancing an immediate sense of pleasure to be derived from a commodity against the pain of giving up other things in order to acquire it. Our view holds that it is only the probabilities as to expected values which can be weighed at the time of purchase. In replenishing or extending the household's stock of goods the crucial consideration is the contribution which an item can make to the potency of the whole assortment. Some items in the stock of goods may have little utility unless the new item is purchased. Potency of the assortment goes beyond complementarily of goods in the ordinary sense, however. It refers to the degree of confidence that the household is fully prepared for whatever is likely to happen.

In the midst of doubt the consumer buyer is confronted with the clamor of the market place, each seller acting as if he was perfectly sure that the consumer should buy his product. Many consumers become

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[6] *Cost and Profit Outlook,* January, February and March 1954.

restive under this pressure and resentful of the whole idea of selling. Their criticism, or that of their self-appointed spokesmen, is largely centered on modern advertising. Advertising is an economic waste, they say. It exaggerates, it misleads, it arouses discontent without contributing to a better understanding of values. While all of these things can happen the only real offset to any tactics adopted by the seller is greater skill on the part of the buyer. However well-meaning the seller may be there is no way in which he can discharge the fundamental responsibilities of the buyer.

Advertising, the presentation of information and argument with respect to products, can affect the uncertainty in the mind of the consumer buyer in three primary ways. If it is to be a problem solving instrument its net effect must be to decrease uncertainty. Yet in one of its fundamental aspects it appears at first glance to bring about greater uncertainty. Oddly enough this effect pertains primarily to the one phase of advertising which most economists will agree has some merit. That is its use in the introduction of a new product or of a model of an old product with elements of novelty or improvement in some of its features.

In order to find a place for a new product in a household's stock of goods it is necessary to convince the consumer buyer that the present range of items stocked is in some sense incomplete or inadequate. In terms of the doctrine of expected values that means that the household is not prepared to meet some contingency which may be as imminent or as significant as those already taken into account. In this sense the promotion of a new product must of necessity bring a new element of uncertainty into the consumer's mind in order to get a hearing at all. Please note that the promotion does not create the problem which the product is designed to meet but only calls attention to it. New product advertising does not create objective uncertainty but increases subjective awareness of it. There is no denying, of course, that the great variety of products advertised may lead to doubt and indecision just as any individual with two problems instead of one has the overriding problem of deciding which one to tackle first. That must be regarded as a consequence of the complexity of modern life and not the direct effect of advertising.

Once a consumer is convinced that he has a problem and that it is the sort of a problem which can be met by acquiring a product there are two further aspects of uncertainty which affect the value placed on the product. The influence of these factors was revealed through observational studies and experiments pertaining to consumer choice. The consumer buyer appears to take account not only of the money cost of a product but of probability ratios which will be designated as the absolute and relative value qualifiers. Shoppers are concerned with both absolute and relative values as they will shortly be defined.

In order for a product to be useful there are usually certain absolute specifications which it must meet. A simple example is the need for a good fit in a garment. There may be a slight tolerance one way or the other around the ideal size. Whether size alone is considered or several absolute specifications, all items for the same purpose may be classed as either acceptable or unacceptable. The absolute value qualifier is either 1 or 0 according to whether the item falls in the acceptable or the unacceptable class. It might appear that there is no uncertainty here since acceptability can be determined at the time of purchase. Actually the most careful shopper cannot be completely sure. The purchase may be for someone else, such as shoes for a growing child. The shopper who is buying a dress for herself may be gaining or losing weight and uncertain as to the outcome. The sofa under consideration may be all right for the apartment now occupied but too large or too small for the new home that is in prospect. The problem of meeting absolute specifications pertains to many other attributes than size. Risk arises from incomplete knowledge of the future requirements which the product is expected to serve.

In actual shopping the buyer does not always decide to buy as soon as an acceptable item has been located. She may go on to a number of other stores in search of the best relative value. The term "best relative value" in this sense should not be confused with price. A hundred dollar item may be a better relative value in its class than a ten dollar item in its class. The comparison in either case is with other products for the same use which might be expected to be available in time for the anticipated occasion or period of use. If the consumer is well enough satisfied with the relative value to proceed with the purchase that means that she thinks the chances are not great of doing better through shopping in additional stores or in waiting for the stores to get in new stocks or to reduce their prices. The relative value qualifier may be expressed as a probability ratio ranging from 0 to 1. The higher the ratio the higher the degree of confidence that no alternative action would constitute a better preparation for the relevant aspects of expected future requirements.

Information and argument can affect all three of these aspects of consumer uncertainty, namely, problem awareness, and the absolute and relative value qualifiers. The economic role of advertising consists of this threefold impact. Advertising a new product or advertising to prospective new users typically undertakes to convince the consumer that a problem exists and that the advertised product will meet the need for which it is recommended. It implies that the trouble arises from shortcomings of the products already in use or that nothing previously on the market will serve the stated purpose. To the extent that consumers are convinced that the advertised product will meet needs that have never been satisfactorily met before they will pay a correspondingly higher price for it. Whether the basis for the product claims are technically valid or not, the effect on price is reached through the effect on expected values. That is the kind of effect which is described by Chamberlin as shifting the demand curve upward and to the right. If the previous situation had been one of a dead level of competition among numerous products with little differentiation it might be more accurate to say that the demand curve for the advertised product was being tilted upward at the left as consumers came to know it better.

An economic justification of this effect on price might invoke the classical principle that present goods are worth more than future goods. The purpose of advertising a new product is to accelerate a change in behavior patterns which might otherwise take place but at a slower rate. Through advertising, a product becomes psychologically available sooner than if the initiative was left entirely to the buyer to recognize a problem and then to try to find something to meet it. Life is short and the consumer who obtains a new source of satisfaction months or years sooner than might have happened otherwise has enjoyed a net gain thereby.

Insofar as advertising affects the value qualifiers it has no direct effect on price but may contribute indirectly to lower prices. To affect the absolute value qualifier through advertising means to publicize the specifications of a product in such a way that more people will put it in the acceptable class. Thus it may increase the number of potential buyers without reference to change in price. If the seller is aware of the increase in potential he may be willing to take the risk of tooling up for increased production. Anticipating economies of scale he may then offer the product at a lower price to dispose of his increased output.

By its effect on the relative value qualifier advertising may increase the units purchased by the consumers who have come to regard the product as acceptable. Such advertising generally stresses the products comparative advantages. Very often these advantages are temporarily or permanently increased to give greater point to the advertising. The advertised sale often involves a cut price or other special offers. The impact of advertising on the value qualifiers cannot be properly interpreted as shifting the demand curve. It should rather be regarded as extending the demand curve which without advertising might actually exist only for a limited group of knowing or well-to-do consumers. As more people become aware of the product's acceptability and its relative merits the demand curve at the right end for the first time takes on reality as a reflection of the state of mind of lower income consumers or others who for any reason will not pay as much for the product even when they become convinced of its virtues.

Advertising which affects the value qualifiers helps to decrease the total cost of selling. The routinization of choice for products which are purchased with high frequency is one of the economic results of advertising through its effect on both the absolute and relative value qualifiers. Routinization reduces both the costs of the intermediate sellers' and the manufacturer's costs of selling them. It is a form of closure tending to limit the double search arising from uncertainty on both sides of the market. In summary there are two aspects of advertising with quite different economic effects. One creates problem awareness and affects the demand for products which are offered to meet the problem. The other helps to routinize trade contacts and hence to reduce marketing costs.

Cigarette advertising is usually cited as the prime example of the evils of advertising. Such critics scarcely ever mention that a large part of the price of a package of cigarettes is represented by Federal excise taxes. It is hard to unravel the social consequences of advertising a product of which half is government services, a large part of the remainder television entertainment plus a little smoke and a modicum of human vanity. Some consumers who do not smoke at all, like the writer, may thank the cigarette industry for a substantial amount of free goods. The retail and wholesale margins on cigarettes are smaller than on most goods of commerce, this reduction in distribution costs being made possible by intensive advertising.

This discussion of the economics of advertising is intended to illustrate the possibilities of the problem solving approach. The more general message of this section is that consumer behavior can best be understood in terms of problem solving and that the adoption of this viewpoint might lead to more rational behavior on the part of the seller in planning his cultivation of consumer markets. The position as outlined draws upon several developments in the theoretical analysis of demand. It has been confirmed in part by experimental work reported in other papers.

## Function and Structure in Competition

Theories of competition are a vital concern to the field of marketing for several reasons. A very practical reason is that government regulation of marketing practices rests ultimately on such theoretical foundations. Neither institutionalism nor the theory of pure and perfect competition is a satisfactory source of criteria for the regulation of modern business. The functionalist viewpoint with respect to competition focuses attention on two classes of problem solvers. One is the business men directing competitive enterprise. The other consists of the government officials who are changed with promoting the aims of public policy through administrative action.[7]

The virtues of competition, for those who believe in its virtues, are that it accomplishes within the larger system what executive decision is presumed to accomplish within a single enterprise. It brings about the allocation of resources which will maximize the output of the system as a whole. Allocation is accomplished through the mechanism of market prices for both end-products and the factors of production. Competition promotes efficiency because the firm which tolerates avoidable waste cannot long survive. It deprives any firm or individual of excessive returns since what he can collect in return for his efforts is controlled by what his competitors are willing to accept. It helps the consumer to obtain the best possible product at the lowest possible cost.

The present view is that all of these things tend to happen in modern competition. The way in which they happen is not very well reflected by a simple model of automatic adjustment within a closed and static system. Not homeostasis but problem solving is the crucial aspect of competitive adjustment. The public administrator is hereby invited to look over the shoulder of the business man while he attempts to solve the problems which confront him in competition. It is not his job to advise or restrain as long as the means adopted are legal. His interest is concentrated on those business problems and those problem solving techniques which impinge upon the objectives of public policy.

It is a commonplace that competitive business is operated in the expectation of earning a profit but that statement sheds little light on the fundamental problems of the firm. Maximizing gain is not the result of a single unified action but of dealing successfully with a number of subordinate problems. Many of these pertain to internal management and have no direct bearing on the regulation of competition. Problems of the firm which are imbued with public interest under the anti-trust laws include entry, survival, and growth. In order to earn a profit an enterpriser must first get into business. He must then survive until profits can accrue. Once he is established his chief hope for increasing his profits is the continued growth of the firm.

The basic fact conditioning entry is the radical heterogeneity of both demand and supply. Chamberlin has recently emphasized that heterogeneity is the natural and original state of the market rather than homogeneity. The same conception led G. F. Shove to remark that economic activity was more like fitting the parts of a jigsaw puzzle than it was a simple allocation of homogeneous supplies. The prospective entrant tries to find a uniquely good match between some segment of the market and some available combination of productive resources. It is this match which constitutes market opportunity. In his search for this kind of a place to stand in the market the enterpriser may be regarded as seeking some differential advantage both over alternative uses of his resources and over other firms already in the market.

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[7] A Functionalist Approach to Competition. Paul D. Converse Award Symposium. 1953. Also, "Factors in the Development of Marketing Channels." Chapter in *Marketing Channels*, Richard D. Irwin Co., 1954.

No responsible marketing consultant would recommend entry to his client except on the conviction that differential advantage existed and had been accurately defined. Simply to supply exactly what others have been supplying is not good enough. It is cheaper and less troublesome for potential customers to maintain their former sources of supply if they gain nothing by trading with the new firm. The newcomer, behaving rationally, will make an exhaustive attempt to find some differential advantage which can swing at least some of the available customers to him. He may find a location which enables him to serve some part of the market better or more cheaply. His product have special features which gives it a superior appeal to at least some market segment. By eliminating services or reducing quality he may reach a group of buyers who are willing to give up some service or quality features in return for a lower price.

Successful entry always implies discovery and frequently involves innovation. A new apparel store may be very much like others of its kind but the entrant may have been perceptive enough to discover the opportunity in a developing suburb and alert enough to get under way before the opportunity was preempted by someone else. In many cases of successful entry innovation is applied to goods or services or to marketing channels and methods.

The innovator who enters the market with a new product is likely today to have started with an exploration of market requirements. Through personal observation or more formal investigation he discovers an incipient demand for the new type of product. In a sense he is creating demand when he introduces the product because he is satisfying a demand which has never before had a chance to express itself precisely in the market. Where the retailer looking for a site is exploring the physical terrain, the developer of a new product is exploring another dimension of the marketing terrain.

Every entrant is faced with uncertainty as to the reality of the elements of differential advantage which he is trying to exploit. He is risking his resources or those of his associates on his judgment that he can capture a given segment of the market. Various theories of profit have recognized the factors of differential advantage, innovation, and risk taking. All of these factors are essential to a general view of what motivates and determines the behavior of the entrant into business. Profit is a reward for the exploration, innovation, and risk taking which is involved in exploiting differential advantage.

In this kind of competitive process the innovator may enjoy monopolistic profits for a time. When he first introduces a new product he is a monopolist at least in the formal sense that he is the only seller of the product. His advantage is not likely to last very long in the presence of a dynamic technology. It is not necessary for dozens of firms just like his own to enter the field in order to deprive him of excess profits. There are several dimensions of differential advantage, actually or potentially, in any field. All are vulnerable to immediate attack with the exception of those backed up by the power of the state such as patents. Geographic advantage sometimes places an effective barrier around a trade territory. Over a period of time it is constantly shifting and being transformed through improved transportation and communication, through technical developments such as electric power transmission, and through changes in the distribution of natural resources and of markets. The various aspects of technological advantage are in general related to use requirements, production processes, and marketing methods. The American economy has seen a shift in relative importance away from geographic advantage toward technological advantage.

Since there are so many directions in which the aggressive enterprise can attempt to get the best of competitors, competition in modern industry tends to become multi-dimensional. Different firms are not merely endeavoring to exploit unique opportunities in the market but these opportunities may be along distinct dimensions of differential advantage. Competitive pressure can become far more intensive under these circumstances than in the atomistic model of competition. It is difficult to hang on to excess profits arising from an original advantage because it is subject to attack from so many directions. The only defense for the established firm is to pioneer new dimensions of advantage as sources of profit to replace those which have been dissipated by competition. Even while it is vigorously promoting the sale of an existing product a firm may be trying to render it obsolete through research for fear that a competitor may do it first.

The public interest in the exploitation of differential advantage is that it is the only way of accomplishing the optimum allocation of resources in the face of heterogeneity. Resources are made up of differentiated elements such as locations, mineral deposits, existing plants and organized groups with special skills. The profit motive is expressed through the attempts of the enterprise to make the most favorable match with a selected segment of the market. New technical developments enter the market through this process. The pace of progress depends on the insight and vigor with which such opportunities are identified and exploited.

Under this form of market organization there would tend to be an equilibrium number of firms for any industry and hence for the economy as a whole. That is to say that there would be an optimum number of firms, neither too large nor too small. If the number were too small it would mean that major aspects of differential advantage were being neglected. If the number were too large it would mean that the average firm would be reduced to an inefficient scale for either current production or the pioneering of continuous improvements. Serious technical difficulties have been encountered in past attempts to formulate the notion of an equilibrium number of firms. This is not the place to deal with these difficulties in detail or to show how the equilibrium number might be determined. The fact that there is at least an optimum range can readily be indicated by mentioning extremes which would obviously fall outside it. Suppose the analysis is made for a community with a thousand families. One firm would be too few because of the obvious need for some specialization in a town of that size. One thousand firms would be too many because most types of enterprise today would need the labor of a number of households to operate at an efficient scale.

Entry and exit would presumably be minimized in an industry which had achieved an equilibrium number of firms. There would be no need for entry if the optimum number of firms was already in operation except, of course, to offset exit. For the economy as a whole the number of firms is affected not only by the number of openings for enterprise but by the number of persons who desire to be in business for themselves. Many persons, including highly trained specialists graduating from the universities, prefer employment with a large firm to proprietorship of a small firm. While there are some who are frustrated in the desire to go into business for themselves there are others who are self-employed only because they cannot find satisfactory positions as employees. Also there are numerous opportunities to go into business on a small scale which are never exploited because no one appears with both the interest and the unique qualifications to fill the niche. There is some question as to whether the concern over freedom of entry is widely shared by persons who wish to go into business for themselves or whether it is largely confined to economists and public administrators who have no intention of doing so.

Survival of the firm has been taken for granted by some economists and regarded as a key problem by others. Interest in this problem is reflected in the emphasis on the phrase “going concern” by Commons. To analyze the problem of survival is equivalent to giving more specific content to the concept of going concern. Since a firm is not an organic entity but only the expression of the motivations and efforts of individuals, it can only simulate the biological drive for self-perpetuation. In this sense, however, a going concern embodies both the ability and the desire to survive.

Ability to survive rests on relationships among firms which Boulding has called the ecological framework and has compared to the struggle for survival among animal species. A firm survives because it occupies a market niche or foothold from which it cannot be dislodged by competition. The basis of this foothold is to be found in the attitudes of the firm's customers and suppliers. It means that the subject firm constitutes a preferred route for the flow or transformation of some part of the stream of goods and services. If this differential advantage pertains to a large enough output to cover the minimum inputs the firm may survive for years without profit in the accounting sense. A firm which is a going concern in all outward appearances can show continuous losses on its operating statement if income fails to meet depreciation charges or to cover the nominal wages of management.

Of greater economic significance is the ability of a firm to withstand temporary losses and come back as strong as ever when the crisis has passed. Without that kind of staying power the firm would not be able to withstand the increased intensity of modern competition. The competitive efforts of progressive firms tend to take the form of a series of campaigns built around a particular set of appeals to consumers or trade customers. The element of surprise is important in launching a campaign. Competitors who are caught unawares are likely to lose business at the fringe of their market. Meanwhile if their market position has a solid core it should sustain them until they have an opportunity to mature campaigns of their own to recover lost ground.

Closure is the basic determinant of ability to survive but in itself it does not guarantee survival. The desire to go on is essential if continuance is at the will of an individual or a group. A firm which is solvent and successful is sometimes liquidated or merged into another firm because of the flagging interest of its principals. An individual proprietorship or a partnership may reflect the maturation and decline of its operating heads rather than obeying the laws of growth for the firm as an entity.[8] The closely held family business may go through a similar cycle even when it is organized on the corporate form. The large corporation, with widely dispersed ownership, tends to escape these hazards of human frailty and mortality. Perhaps the most characteristic feature of what Knauth has called managerial enterprise is the tendency to act as though inspired by a faith in its own immortality. These basic differences in attitudes affecting survival have much to do with the size distribution of firms which has led to the outcry against bigness.

Shares of stock in large corporate enterprises are accepted as articles of commerce. The form of organization solves the problem of continuity in both ownership and management. If the corporation survives indefinitely it is likely to get bigger even if by merely participating in the growth of the national economy. The closely held business remains the vehicle for the enterprising spirit of a single individual or small group. If the firm does not succeed in crossing the line and becoming a publicly held company there is a strong probability that it will disappear. Inheritance taxes may enforce liquidation or sale if it has not already been induced by the capital gain provision.

The desire for growth is an almost universal characteristic of American business. First of all it is a rational expression of the profit motive in any field in which the rate of profit may be regarded as fixed or

[8] "Social Adjustment in Business Management," *Explorations in Entrepreneurial History*, October 1953.

declining. The only way to make more dollars of profit with a profit rate of 2% of sales is to acquire a larger base. The only way to make the same number of dollars if the rate drops from 2% to 1 % is to double the volume of sales. It might be theoretically possible to increase the profit rate through more efficient operation but there are two important qualifications. One is that the most readily available economies are economies of scale which again call for an increase in volume. The other is the long run trend toward declining rates of net earnings brought about by a number of factors including the increases in corporate taxes.

It is not surprising under these conditions that some students have concluded that business men act as if they were endeavoring to maximize gross or total revenue rather than net revenue. In addition to the many instances in which the two objectives are equivalent there are others in which maximizing gross revenue would be the means of maximizing expectations of net revenue. Growth is also an aid in solving other problems of an organization which may be only indirectly related to the goal of maximizing profit or expectations of profit. The kind of personnel which can maintain a vigorous organization typically has greater than average career expectations. Growth is essential for satisfying such expectations and hence competing for that grade of personnel. Steady growth is accepted outside of the company as a symbol of success and helps to create favorable attitudes on the part of both customers and suppliers. Maintaining a system of action always involves a network of mutual commitments both inside and outside the organization proper. The growing company, with a steadily increasing gross income, has a better chance of making good on these commitments.

Growth creates new problems as well as providing the means of meeting old problems. While growth is satisfying expectations it may at the same time stimulate even greater expectations. Expansion may take a company into new markets or new marketing channels which create tensions with established customers or distributors. The manifest destiny of the firm as a growing entity may point in directions that are quite unattractive to the controlling group. It is not uncommon for the presidents or owners of closely held companies to resign or sell out because they are unwilling to accept the consequences of growth. Such firms often continue to advance just the same because of the drive arising from the expectations of other participants.

Growth of individual firms also creates problems for public policy. To begin with, continued expansion of the American economy can doubtless be regarded as a goal of national policy and as a condition for meeting the competition of our commercial and military rivals. Growth of individual firms in both numbers and size is an obvious corollary of national growth and both kinds of business expansion continue to happen. The most bilious critic of bigness has to face the fact that this is a big country with a big future. Assuming that the national goal of growth through business expansion is acceptable to all the role of the administrator is limited to the review of methods employed in growth.

A firm increases the strength of its market position by three broad types of action. It can expand on its present base as the economy grows, simply doing more of the type of business it is now doing. The second method, also representing expansion from within, is to make the discoveries or innovations which will enable it to expand its product line or enter new segments of the market. The third method is to increase its market coverage or its productive capacity through acquisition of other going companies. It is impossible to say that any one of these broad alter natives represents good private or public policy while another is bad. It would be necessary to examine any individual case in terms of the problem the firm was trying to solve, the alternatives that were legally available to it, and the probable effect of these alternatives on the relevant segments of the economy. It has been difficult at all times to arrive at constructive standards for the regulation of American business under such statutes as the anti-trust laws. Possibly one reason is that a dynamic economy will not stand still long enough to be regulated. It may be disastrous if our conception of the nature of the economy stands still while the economy continues to evolve.

There is more hope of keeping regulative yardsticks up-to-date if the responsible administrative agencies will adopt the problem solving approach. What is business trying to accomplish with respect to growth and other basic issues confronting the typical going concern? When should they be given help with their problems and when should they be curbed in the use of doubtful expedients to solve their own? The answers are different for small and middle-sized concerns than for large corporate enterprises. Yet it would be a dangerous oversimplification to say that government should help the one and curb the other. It is true that small business may encounter greater difficulties than big business in securing and analyzing information needed as the basis for judgment. If it is established public policy to encourage small enterprise the Federal government should be expanding its business information services instead of curtailing them as it has done in the past several years. Publicly-financed studies of typical marketing problems at one time contributed to major trends toward progressive improvement in the operations of small business. Today that kind of help is largely restricted to special fields such as agriculture.

As to firms in the middle-range reference has already been made to their tendency to default on their manifest destiny by liquidation or sale to a larger company. The motivations are readily understandable and it may be difficult to find remedies from the viewpoint of public policy. Certainly it would be contrary to our political and economic heritage to order the owners of business to continue against their will as the fascist government of Italy did at one point as a means of preventing unemployment. One device which might be considered is a revision in the tax laws which would encourage the owner of a business to sell it to his employees or reorganize in other ways that would assure continuation as a separate enterprise.

There seems to be no escape from judging the firm which has crossed the line to widely dispersed corporate ownership by quite a different set of standards. One justification of the corporate form of organization is that it permits aggregates of capital which are large enough to accomplish things that could not be accomplished on a smaller scale. Such firms at their best contribute to national growth by extensive research; by innovations in products, production processes and marketing methods; and by pioneering business opportunity for other firms both at their own level and at coordinate levels. If these are the ways in which managerial enterprise manifests competitive vigor then any given move by a large company might be judged by whether it is consistent with such an outlook. Does an acquisition, for example, appear to be an attempt to get ready to compete harder than ever or does it augur a relapse in the direction of the smug and contented monopolist of the textbook? Is it likely to close off opportunity to others or is it a logical step in the proliferation of opportunity? Is productive capacity being acquired to take it out of production or to meet the requirements of a growing market? Does an increase in market coverage involved in an acquisition seem likely to lead to greater values for the consumer under vigorous management or injury to the consumer through increase in prices, restriction of consumer choice, or the elimination of needed services?

## Science and the Ultimate Problem

The marketing executive cannot solve his problems without advancing the objectives of other problem solvers. That principle is basic to his cultivation of the consumer or his negotiations with his immediate associates. The public administrator cannot fulfill his mandate for maintaining a free enterprise system except through a sympathetic understanding of business problems. The scientist cannot arrive at sound generalizations about marketing unless he recognizes that problem solving is a crucial aspect of market behavior. In fact, all social science is essentially the study of how problem solvers interact within a material and cultural environment.

The pragmatic view is not wholly satisfying to some who are concerned about the foundations of science. The quest for ultimate certainty is apparently frustrated by the process of piling problem upon problem in successive layers. Why not move directly to some ultimate problem, such as understanding the universe around us, and make that the business of science? Any attempt at a complete answer would involve some of the deepest issues in the philosophy of science. There are several points which may appropriately be mentioned here in closing.

At the most superficial level one might ask the budding scientist why he should choose marketing if he is not content to contribute to the solution of immediate problems. But even within the field of marketing it is possible to take a relatively long-range or short-range view. This choice depends partly on vocation and temperament and is not inconsistent with the problem solving approach. It is only necessary to think of the scientist as a sort of intellectual enterpriser who is operating according to the theory of expected values. He may prefer to accept long odds that his work will contribute in a fundamental way to the solution of many practical problems, or he may concentrate on specific and immediate problems with a relatively greater assurance of tangible results.

If there is an ultimate problem for science the functionalist would hold that it is an ultimate problem of human nature, with science once more serving in an instrumental capacity. Beyond the attempt to solve lesser problems there may be a deep desire to impose meaning on the world and to originate concepts and symbols to that end.[9] At this level of human aspiration science merges into poetry and philosophy, but even poets must somehow pay their way. We in marketing, on the other hand, need to encourage the desire to excel for its own sake, to scale the previous barriers to knowledge and understanding. To cherish ideals for our chosen activity and to make some progress toward their attainment is the ultimate measure of success beyond the solution of individual problems.

[9] "Psychology for Marketing and Economics," *Journal of Marketing*, October 1952.