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guest editor
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I have always been intrigued by the power of pricing mechanisms in the control and optimization of social systems. Surely the pricing mechanism is a fundamental principle of management science as well as a cornerstone of economics. Yet, I feel that its power is often unappreciated by the management scientist and by society in general.

By pricing mechanism I mean the adaptive system that causes the decisions of society to change in the face of changed resource prices. The chemical analogy is Le Chatelier's principle, which states that a chemical system subjected to a change in its boundary conditions will alter its reaction rates so as to minimize the effects of the change. The generalized theory of Lagrange multipliers provides the mathematical model for predicting the effect of changes in price upon the behavior of the system.

As the economists know, when the pricing system is allowed to operate, there is never a shortage of anything. If a resource is in short supply, its price will increase to the point where the amount demanded equals the amount supplied. This is true whether we are talking about wheat, whiskey, or the country's supply of engineers. Even though few Rolls Royce automobiles are produced each year, no one speaks of the shortage of them because whoever can muster the high price is free to have one. Allowing the price system to operate with as few limits as possible is an effective solution to the allocation problems of society.

To illustrate the importance of pricing mechanisms, let us consider the so-called transportation problem of the United States. In the light of what we have just discussed, I can find no transportation problem. If price is no consideration, I can rent executive jets, helicopter taxis, even dog sleds, and reach any place in the country with a minimum of fuss and bother. The fact that I use much more conventional means of transportation reflects only that I prefer to emphasize consumption of other resources rather than to spend heavily in the area of transportation.

As a specific example in the transportation field, we often hear talk of excessive freeway congestion. The difficulty here is that we do not have a direct charge for freeway use to allow proper allocation of this resource. Since the present allocation is determined by delay-time tolerance, the person whose time is more valuable is paying a higher price for the use of the roads during peak hours than the person

whose time is less valuable; however, he enjoys the same service. Contrast this with a system that charged a direct toll for each mile of roadway, a toll that varied by time of day and day of week. The toll would be high when demand was high and low when demand was low. In keeping with the best Lagrangian principles, there would be no charge when traffic was so light that the addition of a car would not affect traffic. By having a higher charge during peak hours, only those whose time was valuable to society could afford to travel regularly at those hours. Others would delay departure or seek alternative means of transportation, such as rapid transit. Yet, if anyone had to make an important trip downtown at 5:00 p.m., he could always do it—for a price. The frayed nerves and frustrations would give way to the calm apportionment of economics.

Of course, there are technical problems in implementing this proposal, but none that cannot be solved by modern technology through roadway devices that read magnetic car identifiers and modern computer systems. The scheme is worthy of consideration before the present imbalance between private automobile and public transportation produces a transportation system that could never have existed if costs had been properly allocated.

A much less glamorous problem is the disposal of garbage. From time to time we see much hand-wringing about the fact that more and more of the countryside is being covered by dumps. Here again we have the problem of allocating a social cost. A solution lies in taxation, for the power to tax is the power to control, as well as to destroy. Suppose the government decides that, because of the unsightliness of dumps, a higher tax will be charged on land devoted to this purpose. The first effect will be an attempt by dump operators to use their dumps more effectively and, consequently, to require less land for a given amount to be disposed. They will find it economical to use incineration, or to use barges to transport the garbage out to sea (perhaps requiring another tax to avoid pollution of the ocean in the long run). Naturally, the increased costs of the operation will be passed on to the user—the home-owner will find that he now has to pay $2 per barrel rather than $1. This, in turn, will cause him to be more selective in his disposal practices. He will be willing to pay a premium for containers that crush easily and save space. Consequently, the society will make adjustment on several levels as the result of the tax to effect the socially desirable goal of conserving land for other uses.

This example illustrates two important points: first, that tracing the effect of a price or tax charge can have subtle ramifications similar to those observed in ecological studies. The prediction of these changes is a challenging field for the management scientist. The second point is that the taxation policy must be administered at a level of government appropriate to the job. If one county taxes land for dumps, while an adjacent county does not, the main change will be a migration of dump operators to the cheaper base of operations. The gain of society in one location is bought at the expense of society in another. If we think of such problems as air and water pollution, the importance of coordination in controlling them through taxation becomes even more evident.

Of course, sometimes the proper governmental solution to a problem is side-

payments, or subsidies, rather than taxation. The problem of farm surpluses that plagued us a few years ago might lie in this category. Apparently, American society felt that the nation was better off if it had more farmers than agricultural economics would dictate. Various plans were produced to meet this end, but they all had fairly obvious defects. If acreage were limited and farmers were paid for not farming certain land, then they surpassed themselves in increasing productivity on the land remaining. Having created an artificial price mechanism, we had to live with the result. How much simpler it would have been if we had let farmers operate unconstrained according to their profit motives and let the prices of agricultural commodities reach their natural levels. If, when this was done, we found that there were fewer farmers surviving economically than the national interest, in some broader sense, would dictate, then all we would have had to do was to pay each farmer who earned less than subsistence income a subsidy equal to the difference between subsistence income and the income he actually earned. An interesting theoretical method for determining which farmers received subsidies could be to grant the first subsidy to the farmer who required the smallest subsidy, the next subsidy to the farmer requiring the second smallest subsidy, etc., until sufficient farmers were in the farming business. This procedure would satisfy the national goal at minimum cost. Of course, it would probably be profitable to support the remaining uneconomic farmers in a program of retraining for another vocation.

An even more interesting area in which to examine the influence of the pricing system is that of education, particularly public education. At the moment we pay taxes to the government and receive in turn the right to educate our children in schools free of charge. However, our control as individuals over these schools is minimal because they must serve so many contrasting needs. Suppose that as an alternate to the present system, we allot to each parent a certain sum per year per child to be restricted for use in educating the child. The money could be spent at any school certified as professionally qualified. Now private enterprise would be able to enter the school business. If children could be taught more effectively by computers or robots, the school that first introduced such techniques would get most of the business and, hence, most of the profits. If public schools would not follow, more and more parents would select the private alternative. This freedom of choice would solve problems of parochial school support and pupil placement. It would also provide in the public school system a pressure for excellence and economy that now often does not exist.

The problems of crime and punishment can also be treated in this framework. In our society an individual has assigned his right to punish to society in return for the right to protection of person and property. To make sure that the funds allocated to crime prevention are appropriate, it follows that society should insure the individual against and indemnify him for crimes of all kinds, from window-breaking to kidnapping. In other words, society, instead of the individual, should bear the cost of crime. By making the indemnification depend on the steps that the individual took to protect his property—such as whether he had removed the ignition key from a car that was stolen—we could stimulate crime-discourag-

ing behavior on the part of honest citizens. Once the cost of crime were known, it would be within our competence as management scientists to determine how much of society's resources could most profitably be devoted to the processes of crime prevention, detection, prosecution, punishment and rehabilitation. The advantages of having effective parole officers, for example, could be measured in dollars and cents. Spending money on prevention of crime through encouragement of positive social attitudes during formative years would be seen as wise investment rather than as social do-gooding. We would very likely find it worthwhile to increase the pay of the police substantially so as to attract into law enforcement the same levels of ability currently entering business and the professions.

A fairly obvious use of the pricing system is in the manning of the armed forces. We would simply pay high enough wages and fringe incentives to volunteers to attract whatever number and variety were required by our military commitments; there would be no draft. Those members of society who had what were to them more desirable life opportunities than serving in the armed forces would be free to follow them. Since there would be no compulsion, every serviceman would have willingly accepted his lot and, consequently, could be expected to perform his duties with greater enthusiasm and efficiency. Of course, the expense of such a military establishment would exceed present cost under the draft system. This cost would be passed on to all of society by increased taxes, thus sharing the burden of military service indirectly among all tax payers. If the nation were to engage in an unpopular war, it is probable that the pay of the servicemen would have to be increased to attract the necessary number. The increasingly high expenses would serve as a very proper feedback on the true cost of the whole adventure. Conversely, a war that had the support of the populace would find many dedicated citizens who would serve for nominal pay. Such a system seems far more rational than having the burden of military service fall willy-nilly on a small fraction of the population, regardless of whether the individuals are selected by lotteries.

We can make the pricing mechanism work in rather hostile environments if we are careful. Consider, for example, the problem of public utilities. It seems wise for society to grant franchises to such utilities to avoid problems of multiple electric poles, telephone wires, etc., but how can we encourage the utility to make the optimum use of its resources? Often the regulatory bodies limit the return on investment that the utilities can earn. Unfortunately, this practice ignores service, makes efficiency of little value, and encourages the utilities to invest in excess capacity. The key to making the pricing system operate effectively for a monopoly is to surround the monopoly with a pricing environment that encourages it to behave as a competitive institution. For example, suppose that the regulatory body required the utility to pay its customers a penalty whenever it gave them bad service. Thus, a customer would receive a cash payment if the telephone company billed him incorrectly or delayed the installation of a new phone line, or if the electric company did not supply power for some period of time for reasons *within* its control. This would encourage both service and efficient operation. In the case of publicly owned utilities, the problem of pricing could be solved by allowing various firms to bid for the right to operate the system for some period

of time, with the price schedule to be one of the elements of the bid. The same pressure could be brought on private utilities by forcing them to resign their franchise and sell their facilities if a new organization could demonstrate a significant improvement in public service and savings. The problems in this area are challenging, indeed, and pertain as well to broadcasters, airlines, and even taxicab companies.

We have now seen several examples of the power and suitability of pricing mechanisms. Even such a dedicated socialist state as the Soviet Union has learned from experience that the natural behavior of a pricing mechanism is a more dependable route to the efficient use of resources than the most detailed of central planning. I submit that the extent to which the pricing mechanism is allowed to operate in all areas of a society is an important measure of the freedom of the individual.

Ronald A. Howard
Stanford University

Letter to the Editor

With the increasing complexity of our present day business environment, the management executive would do well to acquaint himself with the behavioral sciences, their interrelationships and their impact on his daily activities.

Through an understanding of the individual's personality, or the totality of his behavior characteristics, the business manager can derive substantial benefits. We are always confronted, in the business situation, with the problem of making changes in behavior. Management's function is rarely to keep people doing exactly the same thing all the time. Usually we either want a group of people to start doing something they aren't doing now, or to stop doing something that they are presently doing. And usually, the big problems come in attempting to alter behavior. Since a large part of human activity is involved in the process of modifying behavior patterns and shaping them so that they will be more goal-oriented, it is important for us to look at the processes that occur and the principles that govern them, so that we may utilize these principles effectively in producing changes.

Psychologists have determined that behavior which seems to lead to rewards tends to be repeated, while behavior which seems not to lead to rewards or seems to lead to punishment tends not to be repeated. The principle, sometimes referred to as the "Law of Effect" is not particularly complicated, yet is very important in shaping behavior. We seem to keep the principle in mind when house-breaking a dog but when we become involved in more complicated situations in human interactions we lose track of it. The principle is the same in human behavior.

At work, the superior controls many of the rewards that are available to subordinates. Considering the Law of Effect, it is clear that the superior has a great opportunity for shaping behavior. Indeed, whether he is conscious of it or not, the superior will be constantly shaping the behavior of his subordinates by the way in which he utilizes the rewards that are at his disposal, and he will inevitably modify the behavior patterns of his work group thereby.

For example, a business manager related a situation in which two applicants for a promotion were of nearly equal merit. The somewhat weaker one however, had considerable seniority. Although there was leeway in the contract for a promotion on the basis of merit, the man with the greater seniority was promoted in order to avoid argument. At a later date the same manager was heard to say, "Our biggest problem is that people don't try hard any more, the way they used to." This manager should not have been surprised at his subordinates' performance. For the latter were shown that rewards came for seniority—not for merit. The way in which the rewards are administered determines the ensuing behavior. Thus, if we want to encourage quality in performance, in addition to simple long-term service, we should be careful that the rewards for the two do not overlap. Clear-cut rewards must be retained for merit and must be clearly structured so that they are seen as such.

The same principles hold true in day-to-day situations which, at first glance, do not seem to involve principles of reward or punishment. We might, for example, hear that "the men in the work force don't even give a thought to ways to do their jobs better." Although we might first consider this as a general characteristic of a group of people, we should ask whether we have trained them to act this way. If someone does approach the foreman with a suggested improvement, is he replied to in a manner and tone which suggests, "Your job is to do the work; I'll do the planning"? Such action can be as effective a punishment, or at least lack of reward, as many more carefully planned acts. These small and seemingly insignificant day-to-day occurrences are, in effect, administrations of reward and punishment which shape the behavior of subordinates.

We often hear bank managers complain that their tellers are "not sufficiently zealous in building good customer contact. If only the teller would realize that the bank's continued success depends upon the customer!" And yet all too often the teller gives the approaching depositor the impression that he has interrupted an important job, that the customer will throw his figures out of balance by making a transaction. Management has inadvertantly trained the tellers to act in such fashion by rewarding the teller who carefully balanced his records and punishing him for failing along these lines. No real decision was made to train the tellers this way, but the silent focusing on the problem of control has distorted its importance at every level of management. What could be done differently? Both aspects of the teller's work are important. Rewards must be provided both for his balancing and for his customer contact, and they must be kept separate and distinct, so that it is possible to create a situation where both kinds of behavior tend to be repeated. Thus, in addition to providing reward and punishment, management must accept the responsibility for seeing that the appropriate connection between behavior and reward is appreciated by the recipient of the reward.

The business manager would do well to understand other motivational factors underlying human behavior. Consider the social need for association with other people, sometimes referred to as "the herd instinct." Indeed, the fact that solitary confinement is an extreme punishment is testimony of the strength of the motive. There are many evidences of the operation of the need for affiliation in the work

situation. An employee can effectively be pressured by his co-workers, for example, not to exceed tacit group-set levels of work production. When he finds that conversation stops and that people turn away from him, the deprivation provides a potent force to bring him in line. Egoistic motives are satisfied by recognition, by being able to tell others what to do and the like.

An illustration of the solution of management problems through a consideration of egoistic needs would be the following: One plant with a largely routine operation was producing relatively little in comparison with similar plants. By taking a number of corrective measures, none of which was directly connected with the technological aspect of the business, management was able to increase the plant's productivity to the point where it leads all other plants in productive output. What happened? In the first place, management observed a tendency on the part of its foremen to refer to employees by their number rather than name. If an employee were out, for example, the foreman would phone personnel for a replacement for "Number 20234." When asked whom he meant he would respond by saying: "How do I know who it is? It's Number 20234—send me another guy." The lack of individuality in the foreman's view of Number 20234 could easily be felt by the employee and thus deprived him of a certain measure of egoistic need-satisfaction. The minimum of recognition on a job is at least to be recognized beyond, "Hey you."

Here's what management did. Each foreman was given a card to fill out for each of his subordinate employee numbers, which required information as to name, address, wife's name, number of children, age, previous job history, hobbies etc. The most important provision was that the foreman had to fill out the card without the employee knowing that the foreman was getting the information. The personnel office, upon receiving the information on the completed cards merely discarded them—for it had already had the information in its files. It achieved its objective of having the foreman see his men as individuals instead of Number 20234. In addition, as many men as possible were given training in jobs other than their own. Although it would have been cheaper to replace turnover by hiring new men, the method employed gave the employee a feeling of growing and accomplishment. Advances such as these in the provision of egoistic need-satisfaction probably materially aided the company's improved production.

The behavioral sciences have significant import not only in the business world, but even more extensively in the administration of our government. The behavioral scientist might be asked to indicate the phenomena that must be taken into account in developing a federal policy or program. In connection with a civil defence program, the behavioral scientist might be asked to present his findings on panic behavior. He is thus being asked to translate his knowledge into operating principles that are applicable to the problem at hand. Anthropologists have likewise been used as trobule shooters in community development projects, to find out what has gone wrong and why.

The behavioral sciences are becoming increasingly important to the business executive. As a faculty member in the Business Division of Long Island University, the writer has encouraged his colleagues to carefully study the utility of an

integrated approach to the behavioral sciences, with a consideration of their particular utility in the business world. The undergraduate business student has much to gain by being exposed not only to the pure theoretical concepts of the behavioral sciences, but to their business import as well.

Herbert J. Weiser
Long Island University

Letter to the Editor

Many articles in previous issues of this Journal have indicated a widespread and deep concern with the problem of implementation. We are justifiably troubled by the lack of confidence in our findings and recommendations manifested by operating managers. Generally, we attribute this lack of confidence largely to the difficulties in communicating technical matters to people without proper training and background. On the basis of much that I have read in our professional journals, however, I have concluded that the communications problem—difficult as it may be—is only a partial explanation of managers' resistance to our ideas. Our own failure to maintain high standards of professionalism and scientific probity, especially in articles addressed to management personnel, seems to be an equally important reason for the distrust we have all experienced.

As a case in point, I shall analyze an article which appeared recently in Series B of this Journal (April, 1967) entitled "Cluster Analysis in Test Market Selection" by Green, Frank and Robinson. There is nothing especially unique about this article which should cause it to be singled out as a target of criticism; any number of articles which have appeared in Series B could be used by way of illustration. The article's recent appearance makes it particularly apropos to my argument, however, and so it can serve well as representative of a number of similar writings which tend to aggravate our position *vis-a-vis* managers.

It is difficult to divine the true intention of the Green, Frank and Robinson article. Perhaps their only purpose was to call attention to a group of diverse techniques which can be subsumed under the title "cluster analysis." There is certainly a place for such descriptive articles in our literature. It would be hoped, however, that the *raison d'etre* for such an article would be a conviction, based on reasonable evidence, that the method described can be usefully applied to particular problems. Indeed, the authors apparently agree that such a rationale is necessary. In the concluding section of their article they have said, "Only one possible application of cluster analysis [to the selection of test markets] . . . has been touched upon in this article. Despite the many limitations of this set of techniques, clustering procedures could be helpful in a variety of marketing problems in which numerical classification is desirable."

That these techniques could be helpful is an assertion and not, as it would seem, a statement of fact. Not one shred of evidence to support this assertion is offered either in the text or as a bibliographical reference. It is true, as the authors suggest, than many procedures for cluster analysis have been developed by researchers in the life and behavioral disciplines. It is also true, however, that

researchers in these disciplines are by no means agreed that these procedures are useful for their problems. Moreover, after an entire year of intensive study of the literature pertaining to cluster analysis in these disciplines, I have yet to find any article which could be accepted as firm evidence that these methods lead to improved diagnoses or predictions. My own conclusion is that no evidence for the assertion of potential usefulness exists. This is the "state of nature" in the life and behavioral sciences where these methods have received considerable attention and it is certainly the "state of nature" in marketing where these procedures have not been widely known or used.

But what is a manager or marketing researcher to do when he reads such assertions of promise and potential in a highly reputable professional journal? He cannot know that no evidence to support the assertion exists. Too often, therefore, he accepts what he has read in our journal as truly authoritative and a new fashion in statistical analysis arises. Every researcher and manager speedily turns to the new panacea, for not to use the new procedure is not to be "with it." Computer tapes spin and a flood of reports appears until eventually it becomes clear that marketing knowledge and marketing science have not been advanced one little step. The reaction sets in and often the form it assumes is a conviction not to be taken in by those management scientists again.

Surely, scientific integrity as well as concern about our consumers should prevent us from rushing into print with promises we do not know we can keep. If we are to make promises and loudly announce the addition to our repertoire of a tool with great potential utility, don't we owe those who are listening some evidence that our promise has a basis in fact?

So far I have considered the article under discussion as solely a device for calling attention to a technique which is not widely known. However, both the article's title and content suggest that the authors' intention went beyond this. Do they not leave a reader with the distinct impression that cluster analysis, as they have described it, constitutes a method for the selection of test markets which is superior to those currently in use? I believe they do and I submit that in doing so, they are making another assertion, implicitly this time, but an assertion nonetheless. In many ways this assertion is even more damaging than that discussed above. For have not the authors failed, in a professional publication, to test the validity of their conclusion and to show the nature of their tests and the results of these tests to their peers so that the work can be properly evaluated?

The question I want to investigate further is this: Does the article provide any evidence that cluster analysis can make a substantial contribution to the selection of test markets? Does it have any internal validity? It seems that a reasonable approach to this question would be to examine first the face validity of the results. These results are set out in Tables 2 and 4 of the article and indicate the eighteen groupings of cities which are supposed to be in some sense '"similar' within clusters and 'different' among clusters." In the context of our problem, the selection of cities for test markets, similar and different must mean that customer response to the company's offer is more nearly alike in any two cities within the same clus-

ter than it is in any two cities in different clusters. Otherwise it would make little sense to select a single city from a cluster to represent customer response for all other cities in that cluster, as the authors suggest.

My own experience, as well as the reactions of a number of marketing researchers with responsibility for test marketing whom I have queried, indicates that there is no face validity to the clusters which emerged from the analysis. In fact, I cannot believe that any experienced marketing researcher would be willing to generalize results obtained in Paterson to Seattle, or from Charlotte to Portland, or from New Orleans to Minneapolis. Yet in the groupings obtained from unfactored data, each of these pairs of cities, as well as many other pairings of the same kind, are found in the same cluster. And the results are no different when one examines the groupings obtained from the factored data. Here one finds such anomalies—at least they are anomalies from the point of view of marketing research in general and test marketing in particular—as the grouping within the same cluster of Tacoma and El Paso, Atlanta and Seattle, Tampa and Jersey City, just to mention a few. As one who has spent more than a decade studying consumer responses to marketing offers and who is all too cognizant of the great regional differences in consumer buying attitudes and habits which exist in the U.S., I can scarcely believe that the authors are serious in suggesting that they have produced clusters which have any meaning in the context of test market selection.

Even if the clusters which emerged had *face validity*, however, the problem of internal validity of the study would be far from resolved. Some demonstration is required, surely, that: 1) any city within a given cluster is more like the cities in that cluster than it is like the cities in any other cluster, i.e., that the variance within groups is less than the variance between groups, and 2) the clusters are really different in the sense that the mean profiles of the various clusters differ from one another in shape and/or level. Instead of testing for the existence of these conditions which must be satisfied in order for the clusters to have any real meaning, the authors have provided a diagram (Figure 2) on which all of the cities have apparently been plotted as points in the two dimensional factor space but only three of the eighteen clusters have been identified. Moreover, two of the three clusters seem to have been carefully chosen because they contain cities which occupy extreme positions in the factor space. What, I ask, would the diagram have looked like if the remaining fifteen clusters had also been shown? These fifteen would have had to fall in the area of greatest point density and I wonder about the following: How much overlap of clusters would exist? How many points included in one cluster would actually be closer in the space to a point in another cluster than to the nearest other point in its own cluster? How many points included in one cluster are actually closer to the centroid of another cluster than they are to the centroid of their own cluster? In all, the figure is no evidence that meaningful clusters which satsify a reasonable definition of "similarity" and "difference" exist and if it was interpreted as being such evidence, then it is positively misleading.

Multivariate statistical techniques exist (cf. D. F. Morrison, *Multivariate*

Statistical Analysis, McGraw-Hill, 1967) for testing whether the within group variances are less than the between group variances and also for testing mean profile differences in shape and/or level. I wonder that neither the editor of our journal nor the referees demanded that the authors make these tests and provide evidence that they had clusters which satisfied the conditions for similarity and difference before accepting the article for publication. Do they not share with the authors responsibility for contributing to the lack of confidence and trust which exists among marketing managers and marketing researchers?

In all then, the article being discussed contains no evidence of either the face or internal validity of the method recommended as being potentially useful. In fact, a reader could justifiably question whether cities selected as test markets in the manner suggested would provide a better sampling of consumer responses to a marketing offer than would cities selected from the same list by simple random sampling or geographical stratified random sampling. What the article does say, which is true beyond reasonable doubt, seems to be only this: In many disciplines, for many years, researchers have been searching for methods of dealing with the problem of classifying objects on each of which there are numerous measurements, and they have developed a multitude of techniques for obtaining classifications, one of which is described. Beyond this, however, this article and many others like it which have appeared in our professional journals are merely hortatory in tone and virtually empty in usable content. They constitute, in my opinion, an important source of the growing managerial resistance to our ideas. I do not believe that professional journals in the other sciences would publish articles which make assertions without evidence and promises without a factual basis, and I do not believe we should do so either. If we are to be treated as professionals and to be given by our "clients" the confidence and trust due professionals then we must, especially in our literature, maintain the highest standards of scientific reporting. I believe that it is time, as the old negro spiritual "Do Lord" says it, "for all us sinners to save ourselves and do good." No one will think better of us than we do ourselves and we can think well of ourselves only to the extent that our literature offers not unsupported assertions but conclusions based on a foundation of evidence available to all for analysis and testing.

Abe Shuchman
Columbia University

Letter to the Editor

My enjoyment of Ferber's article, "The Role of the Subconscious in Executive Decision-Making" (April 1967), was heightened both by its juxtaposition to the Rubenstein, et al. article, "Some Organizational Factors Related to the Effectiveness of Management Science Groups in Industry," and the nexus between the two articles created by Longman's critique of Ferber's article. It seems to me, however, that Longman maligns the management scientist, subconsciously of course, by not attributing to him the same potentially irrational and subconscious motivations with which he credits the practicing manager.

For example, Longman says, "We provide the [manager] with a complex (or at

least unfamiliar) model of the problem, and he finds it difficult to understand." True, part of the complexity results because complex problems seldom have simple answers. And some of the difficulty in understanding does indeed stem from the manager's ego involvement and his inability to intuit the results of the analysis. But I submit that this is not the root of the difficulty in understanding either our models or our analyses. Rather, the root difficulty is to be found in the description by Rubenstein, et al. of the relation of the manager and the OR/MS as one of "client-consultant." This image that we have of ourselves as professionals, akin to that of a doctor to his patient, represents our own ego-involvement with our work, and our conscious, or subconscious if you will, view of our latent status.

If we were to abandon our arcane prose, eliminate the "in" jargon, simplify our complex symbolism; in short, translate from the language used for analysis and communication among the professional OR/MS's to the ordinary English spoken by the manager, we might strengthen our acceptance, but at the same time we might threaten our subconscious image of professionalism. The question—and it is a question rather than a criticism—is whether we want to be understood.

Harry Tobey
Columbia University