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REPORT ON MANAGEMENT POLICY
IN
INDUSTRIAL RESEARCH ORGANIZATIONS

by

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REPORT ON MANAGEMENT POLICY
IN INDUSTRIAL RESEARCH ORGANIZATIONS
IN DEVELOPING COUNTRIES

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ABSTRACT

Report on Management Policy in Industrial Research Organizations

OBJECTIVES AND SCOPE

Under a Special Services Agreement made between the United Nations and the writer dated 11 April 1966 the following services were scheduled to be performed :

- a. Prepare a report on "Management Policy in Industrial Research Organizations".
- b. Prepare an analysis of subjects of essential importance in developing and improving the managerial competence of management personnel of these organizations in developing countries.
- c. Provide more knowledge and understanding of the management of the management aspects as a process.
- d. Discuss principles necessary to formulate management approach to problem solving, set policies, and organize, co-ordinate and control resources.
- e. Emphasize the decision making process.
- f. Provide a list of valuable references.

ACTIVITIES

In order to carry out the objectives listed above, the writer reviewed the significant literature in the field, interviewed and corresponded with researchers and managers employed by industrial research organizations throughout the world, and observed detail operations of industrial research organizations in the Republic of Korea.

GENERAL OBSERVATIONS AND CONCLUSIONS

Based on a review of the literature in the field, correspondence and interviews with knowledgeable people on the subject, and the writers own experience as an honorary director and advisor to two industrial research organizations in the Republic of Korea some of the more salient observations and conclusions are presented.

1. A major source of problems in industrial research organizations has been a failure to define the variety of forms and activities research may take, each requiring different skills and different people.
2. An expedient method of classifying industrial research organizations is to place their research activities under three headings (a) basic research (b) applied research, development, and testing on products and processes, (c) research in economic and business management.
3. A management policy that should be instituted by any industrial research organization is one requiring the installation and maintenance of an adequate technical library. A problem forcing the organization is not whether information is available but where it is and how to find it.

4. An emphasis should be placed on research into technical and managerial problems of small and medium size companies because of their numbers and importance to the developing countries.
5. A management policy that would make basic research more effective would be one that would require participative leadership on projects i.e. basic researchers should be in charge of basic research administration.
6. A communication barrier between researchers and research managers is a major obstacle to efficient applied research and development.
7. A concept titled "Mutual Understanding" which embraces the concept of researchers becoming something of a manager and the manager something of a researcher offers the best solutions to human problems in applied research and development work but the kinds of relations that will bring it about must be delineated.
8. A sound management policy for economic and business research would require maximum activity related to empirical field research on management processes and problems.

**MANAGEMENT POLICY IN RESEARCH AND DEVELOPMENT
IN UNDERDEVELOPED COUNTRIES**

PART I - INTRODUCTION

During the past few years leaders in government and industry in many developing countries have shown in their speeches and writings a vehement enthusiasm for research. The following quote by Park Chung Hee, the President of the Republic of Korea, is characteristic. "The best efforts to establish an under-developed economy will best be accomplished through the promotion of science and technology using the wisdom and talents of our people as a great resource." ¹

Doubtless, this enthusiasm for research has come about, in large measure, as a result of the importance science and technology has played in the leading industrial countries of the world. Expenditures on research in these countries have resulted in exciting achievements in space, new materials and products, and spectacular growth of companies and industries. A good case can be made that the strongest growth industries are those spending the most on research. ² In view of the role research has played to date and the increasing role it portends for the future in the developed countries, it is small wonder why leaders of under-developed countries look to research as a vital stimulus and elixir for their economic, social, and cultural development.

STATEMENT OF SCOPE OF THE STUDY

It is the objective of this report to make more discernible the nature of problems involved in managing industrial centres in under-developed countries and to offer some prognosis for improvement. This report seeks to provide the reader with more knowledge and understanding of the interaction and activities of managers and researchers employed by industrial research organisations in under-developed countries. It will attempt to formulate useful generalisations regarding

1) Park Chung Hee, Statement on the Second Five-Year Plan for Development of Science & Technology 1967-1971, Government of Korea, July 1966.

2) G. Wilson Randle, Selecting the Research Program: A Top Management Function, California Management Review, Winter, 1960, P.9

managers of industrial research organizations' approaches to problems, alternative courses of action, and plausible solutions.

It should be inferred from the previously mentioned statements that this report will not focus on problems related to financing or initiating an industrial research organization. It will be assumed that an organization exists, it has adequate facilities, and sound financial backing. In order to make the scope of this work manageable, major emphasis will be placed on problems in planning, coordinating, directing, and controlling research activities.

RESEARCH METHODOLOGY

The research methodology employed in this report is threefold. First, it will consist, in the main, of a review of the significant literature in the field directly and indirectly related to the subject. Second, it will contain information obtained from interviews with managers and researchers employed by industrial research organizations in under-developed countries. Third, it will include the impressions of the author based on close association with and observation of industrial research organizations in the Republic of Korea over the past six years.

DEFINITION OF TERMS

It is necessary to reduce at the outset the ambiguity of the terms, research, industrial research organizations, management, policy, and developing nations, for each has many meanings. It is interesting to observe that the definition of terms, as the first approach to any inquiry, has been advocated by scholars of different ages and cultures. In the literature of the East we note Confucius has said, "If names be not used correctly, then speech gets tied up in knots; and if speech be so, then business comes to a halt." 3 In the literature of the West we note in Plato's PHAEDRUS, Socrates, by means of the dialogue, points out how fine differences in language could

3) E. R. Hughes, Chinese Philosophy in Classical Times

lead to grave errors and misunderstanding. And centuries later, Thomas Hobbes wrote, "So that in the right definition of names lies the first use of speech; which is the acquisition of science; and in wrong or no definitions, lies the first abuse from which proceed all false and senseless tenets." 4

In my view, a major source of problems in industrial research organizations has been the failure to recognize that research itself takes on a variety of forms and activities, each requiring different skills and different kinds of people. Yet, each kind of research makes a contribution to our economic, social, and cultural development.

Webster's NEW INTERNATIONAL DICTIONARY defines research as, "a careful or critical inquiry or examination in seeking facts or principles, a diligent investigation to ascertain something."

This definition implies that research is not merely a search for truth, but a prolonged, intensive, purposeful search which may or may not accomplish its objectives.

Other definitions are expressed as follows:

(1) Research is, in short, a collection of activities aimed at advancing knowledge and technology of our society. It consists of two processes, a process of developing new knowledge and technology, and a process of making them available to others. 5

(2) Research is that genuinely scholarly work which accumulates new fundamental knowledge, first through accurate descriptive stages and empirical findings, and ultimately through testing of hypotheses and confirming laws and principles. Identifying a basic discipline requires the supporting mechanisms of scientific methodologies. 6

4) Thomas Hobbes, Leviathan, Part I, Chapter IV

5) Yuji Ijiri, Research and Its Processes, Working Paper Number 36, Stanford University, p.1

6) Dalton E. McFarland, The Emerging Revolution in Management Education, Journal of the Academy of Management, April, 1960, p.15

(3) Research attempts to define the basic physical principles involved in a problem, whether this is a method for doing something, a process for making something, or an object itself. This definition of research includes both basic and applied research, which frequently differ only in terms of the objective which is set for the investigation. ⁷

(4) Research is a high-hat work that scares a lot of people. It needn't. It is rather simple. Essentially it is nothing but a state of mind — a friendly, welcoming attitude toward change. Going out to look for change, instead of waiting for it to come. Research, for practical men, is an effort to do things better and not to be caught asleep. The research state of mind can apply to any kind of business, big or little. ⁸

The previously mentioned definitions should suffice to reinforce the hypothesis that research can be defined in many ways. It is useful for this report, however, to divide research into three categories: (1) Basic research which is primarily knowledge oriented, (2) Applied research, development, and testing on products and processes which are primarily product and process oriented, and (3) Economic and business management research which is primarily non-technical oriented.

Let us now search for a workable definition of the word industrial research organization. Organization has been defined by James D. Mooney to mean "concerted human effort, the kind of effort that is essential to the highest measure of success to any group undertaking." ⁹ Chester I. Barnard defined organization in this way, "formal organization is a kind of cooperation among men that is conscious, deliberate, and purposeful." ¹⁰

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- 7) Philip J. Elving, Research: The Value of the Impractical, Michigan Business Review, July, 1955, p. 11, Hereafter cited Elving
 - 8) Dr. Charles Kettering, Director of Research, General Motors Corporation
 - 9) James D. Mooney, The Principles of Organization, in Luther Gulick and L. Urwick (eds.), Paper on the Science of Administration, Institute of Public Administration, New York, 3rd edition, 1954, p. 92.
 - 10) Chester I. Barnard, The Functions of the Executive, Harvard University Press, Cambridge, Massachusetts, 1956, p. 4

The most important have names, officers, or recognized leaders, and reasons for existence that may be approximately stated.

To paraphrase Ralph A. Krause, the functions performed by industrial research are, (1) to provide technical and economic services for industry, (2) to provide technical assistance in development and industry planning, (3) to develop technical manpower and enhance the scientific and technical capabilities, (4) to provide liaison with and obtain services from foreign personnel and research organizations." 11

A definition of an industrial research organization that is succinct and usable is as follows: a conscious, deliberate, and purposeful cooperative human effort designed to provide scientific, technical, and non-technical assistance for a country, a segment of the economy, an industry, or individual firm, and equipped with laboratories and supporting facilities.

One further word, references will be made in analyzing different kinds of research activities on the relative efficiency of government industrial research organizations, university industrial research organizations, and private industrial research organizations. To paraphrase Dr. Philip J. Elving, there are basic reasons for the existence of industrial research organizations. To assist in (1) the preservation of an existing market, (2) the entry into an existing market, and (3) the origination of a new market. It will be necessary in this report to discuss briefly the roles played by the industrial research organizations in obtaining these objectives. 12

Now, let us turn to the definition of the word management. Like research, the word management has many different meanings. It is sometimes broadly defined as follows: It is concerned with leadership and administration, and its objective is to get work done through people. Needless to say, this definition requires further definitions of administrative functions

11) Ralph A. Krause, Role of a Research Institute, Stanford Research Institute, Menlo Park, California, p. 1

12) Elving, p. 12

and leadership functions. Administrative functions include: (1) planning and decision making, (2) setting up and staffing the organization, (3) actuating its daily activities, (4) controlling. Leadership functions are: (1) delegating tasks, (2) motivating subordinates and colleagues to effective performance, (3) assuring a good work climate, (4) producing and selling ideas, (5) developing executives and others in the organization to obtain even better performance and to provide for management succession. 13

A word of appreciation is due Colonel Lyndall F. Urwick, who dramatically illustrates the utter confusion surrounding the definition of management. He points out that it has been defined as a function, a process, a structure, a part in the organization, an act, the development of persons, techniques, a philosophy, methods, knowledge, relations, a mental attitude, an art, a science, and so on. 14

For the purposes of this report the following definitions will apply: (1) Management deals with all processes and activities concerning managing, (2) Managing means, as previously cited, the process or activity, (3) Managers are those persons who are involved in the process or activity.

Management, as used in this report, will mean the art of getting things done through and with people in FORMALLY ORGANIZED GROUPS, the art of creating an environment in such an organized group where people can perform as individuals and yet cooperate toward attainment of group goals, the art of removing blocks to such performance, the art of optimizing efficiency in effectively reaching goals. 15

In general, policies are written, or oral guidelines established to assist managers in making decisions. Professor Harry R. Tisdal of Harvard

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- 13) H.N. Broom, Production Management, Richard D. Irwin, Inc., 1962, Homewood, Illinois, pp. 1-2
 - 14) Colonel Lyndall F. Urwick, The Problem of Management Semantics, California Management Review, Spring, 1960, p. 78
 - 15) Harold Koontz, The Management Theory Jungle, Journal of the Academy of Management, December, 1961, p. 186

University uses the following definition that can be applied to this report, "Policy implies a definite course of action, predeterained for the purpose of insuring uniformity of procedure under substantially similar and recurrent circumstances. It aims to provide a uniform course of action, both as between different periods of time (so long as the policy is in force) and between different members of the organization who have the responsibility of acting within the confines of such policy." 16

Attempts to define the word developing or under-developed country exists throughout the literature in economics and business administration, Here are some of them. "The term under-developed countries usually refers loosely to countries or regions with levels of real income and capital per head which are low by the standards of North America, Western Europe, and Australia. In under-developed countries there is no large-scale application of the fruits of scientific and technological advance to agriculture and industry; subsistence production is generally important and markets comparatively narrow; and manufacturing industry is usually comparatively unimportant. As generally used, the term covers the whole of Asia (with the possible exception of Japan), Africa, Latin America (with Argentina sometimes omitted), and parts of Eastern and Southern Europe. Defined in this way, the under-developed areas contain about three quarters of the population in the world. Under-development refers simply to a low level of economic and technical achievement, it does not refer to other achievements in qualities." 17

"While it is thus fairly simple to tell that a country is under-developed, it is not so easy to measure the extent of its underdevelop-

16) Harry R. Toedal, Problems in Sales Management, 4th Edition, New York, McGraw-Hill Book Co., Inc. 1939, p. 7

17) Peter T. Bauer and Basil S. Yamey, The Economics of Under-Developed Countries, University of Chicago Press, 1957, pp. 3-5

ment or to set up an exact statistical definition of what constitutes underdevelopment."¹⁸

In the main, Robert J. Alexander adequately describes as underdeveloped country. He states, "To our mind, there are seven basic qualities underdeveloped nations possess. All under-developed countries do not have all of them but all under-developed countries do have one or more of them. These qualities are: (1) a low per capita real income, (2) an "unbalanced" economy, (3) natural resources that are either largely untaooped or are being used by and for the benefit of the highly industrialized nations, (4) a tradition-oriented rather than a market-oriented economy, (5) small amounts of capital equipment relative to the labour force, (6) structural under-employment, and (7) the widespread belief among the people of the country that it is "under-developed."¹⁹

There has come into vogue in recent years the use of such terms as, "poor nations, less developed nations, and developing nations." These terminologies are used to make subtle distinctions between countries categorized under the general term under-developed. It is obvious there is a distinction between a country that has little or no industry compared to a country that has industries, but per capita income is low. Or a country that has a cadre of adequately trained engineers and workers, but lacks the proper facilities compared with a country that has few technically trained personnel. Robert Alexander's definition will be used with the additional constraint that low per capita income will mean less than \$500 a year. As Barbara Ward puts it, "If you fix the level of wealth of "wealthy" communities at a per-capita income of about \$500 a year then eighty per cent of mankind lives below it."²⁰

18) P/G. Hoffman, 100 Countries-1.1/2 Billion People, Washington Committee for International Economic Growth, 1960, p. 14

19) Robert J. Alexander, A Primer of Economic Development, New York, MacMillan, 1962, p. 5

20) Barbara Ward, The Rich Nations and the Poor Nations, New York, W.W. Norton, 1962, p. 38

Hopefully, the attempts to define significant terminologies used in this report have cleared away not all but much of the semantic brush which obscures the path to proper investigation. It would be presumptuous to assume that the terms, research, industrial research organizations, management, policy, and development or underdevelopment conditions, could be defined with fine precision in the few pages of this report allotted to their definition. Indeed, they cannot. These are broad terms requiring far more time and effort than the scope of this report permits. Yet, if management is to be a science rather than an art, it will be of the utmost importance that a more precise measurement be found to express these terms. Still, the reader should now have a basic understanding of these terms and be cognizant of the fact that this report will emphasize problems involving managers and researchers in industrial research organizations and ways of finding workable solutions.

PART II - BASIC RESEARCH

Basic research can be defined as a search for new knowledge for knowledge sake without concern for any practical applications. It has been referred to as a struggle for the possession of strong points held by nature with extreme tenacity.²¹ David Novick has written, "The original work of all three (Darwin, Einstein, and Newton) had the identifying mark of seeking understanding of the universe and not a particular use or uses for the principles which were propounded."²² In this context, we can say basic research seeks an understanding of nature"

Now that basic research has been defined, it is essential that we evaluate its importance. First, we know that applied research generally

21) David B. Hertz, Is Technology Depeding Research? California Management Review, Fall, 1960, Volume 3, Number 1, p. 29, Hereafter cited Hertz

22) David Novick, What Do We Learn by Research and Development?, California Management Review, Spring, 1960, Volume 2, Number 3, p. 16

follows basic research. There are, of course, exceptions. A review of the Industrial Revolution in England reveals that basic scientific knowledge was not necessary for many of the inventors of the time. They were, for the most part, practical men who had an aptitude and technological know-how. In recent years, however, Bassell and Nelson inform us that the recent advances in chemical and electronic technology have been the result, in large measure, of formal science. And that knowledge (attained from basic research) serves primarily as a reference book determining the skill with which people concerned with solving practical problems are able to surmount the difficulties.²³ The development of the gas-filled lamp by scientists working for General Electric Corporation was highly profitable, as was in later years the replacement by that company of carbon by silicon. Unfortunately, the results of basic research in terms of profits to a company are uncertain and the basic research groups expensive to maintain, that is, if this activity is carried on in an industrial research organization, almost complete government subsidy is required.

RESEARCHERS

We note in the literature that persons doing basic research are unique. They differ in many respects with persons doing applied research. The words of William B. McLean reflect this idea. "The creative scientist is a rare type of individual representing only a small portion of the total population and even a small fraction of scientists. He is a nuisance, causing untold trouble for administrators and those who would like to use his services. However, in the proper circumstances and climate, his output may be very valuable."²⁴ Because the person engaged in basic research questions even the most obvious assumptions, it is readily apparent that he requires a

23) Benton F. Bassell & Richard R. Nelson, Research and Economic Growth, California Management Review, Winter, 1962, Volume 4, Number 2, pp. 88-89

24) William B. McLean, Management and the Creative Scientist, California Management Review, Fall, 1960, Volume 3, Number 1, p. 9, Hereafter cited McLean

maximum amount of freedom in making inquiries. He seeks to find weak points in present theories and to replace them with a sounder hypothesis. Obviously, he cannot tell in advance what achievements he will be able to make. He only attempts to find an understanding of nature.

Admittedly, the picture of the basic researcher that has been drawn is only a stereotype. Individuals can vary considerably, but it is this quest for knowledge of nature's secrets that results in major advances which are not likely to occur when men of this caliber are not restricted in their research efforts. They seem to function best when allowed to follow their own intuitions and interests.

This great drive for creativity makes the basic researcher work-oriented rather than organization-oriented. As William B. McLean puts it, "If you ask the researcher to stop doing some particular job he happens to be interested in, he is very likely to leave your organization to find another one which will support the work which has captured his interest."²⁵

William R. Gall points out, "Corporate loyalty sometimes has a secondary emphasis to a dedicated scientist."²⁶ The degrees of loyalty will depend to some extent on the culture in which the basic researcher was reared. That is to say, in cultures that are more authoritative and demand loyalty to an organization, there is a tendency for the basic researcher to follow the basic forms of loyalty expected. But in the final analysis his primary loyalty is to his discipline, and his second loyalty to his colleagues in his discipline. The loyalty to his colleagues is necessary because it is they who pass professional judgement on the merit of his research.

25) McLean, p. 10

26) William R. Gall, Not by Loyalty Alone, Journal of the Academy of Management, August, 1962, p. 120

MANAGERS

A research study made by the Opinion Research Corporation, in 1959 concluded that, "The management mind conflicts with the scientific mind in approaching risk-taking and decision making -- the management mind is integrative while the scientific mind is analytical." ²⁷ With this fundamental difference in mind one can easily predict the kinds of problems which can arise in establishing policies and objectives and the procedures necessary to carry them out.

It should be pointed out that in many developing countries of the world today persons doing basic research are young. These men have been trained, in large measures, in many of the leading universities of the developed countries throughout the world. They have specialized in mathematics and the basic sciences. They have extensive knowledge in their field, a free, inquiring spirit, and usually a complete lack of understanding of business and economics. It is this weakness in the administrative skills that has lead many managers to conclude that basic researchers are poor administrators.

Yet, there is evidence to substantiate the hypothesis that when highly creative basic research is required in an industrial research organization, the managers of the project should, without question, be basic researchers. The following quotation substantiates, in part, this point of view. "Some of the most creative laboratories in the world, in the latter part of the nineteenth century, were German laboratories, particularly in chemistry. As far as organization, discipline, and coordination are concerned, I doubt if there were any laboratories in the United States to compare with them. Observing the success of their discipline and operations, we find that the coordination, the direction, the organization, of these German laboratories was in the hands of scientists and good scientists.

27) Opinion Research Corporation, The Conflict Between the Scientific Mind and the Management Mind, September, 1959

I think this is where we make a mistake in many of our laboratory operations. Perhaps some of our scientists are abdicating both the responsibility and the opportunity to direct, organize, and coordinate research as scientists. They are turning this problem over to administrators and businessmen. Let us explore the reasons why this has occurred and why it may be a serious mistake." 28

This point of view was further corroborated by a recent study on the inter-relationship of leadership style and motivation and attitudes of laboratory scientists. This study emphasize the point, as has been done by Hertz, that in basic research participative leadership is the most effective. It suggested that by participative leadership the researchers felt they were utilizing their abilities, they had more freedom for originality, and consequently, could make a greater contribution to basic research.

A major advantage of having a scientist or basic researcher in charge of basic research administration is that he understands thoroughly the language of his discipline. Admittedly, he may require training in administration. He is also able to pick out the persons who can best help him carry out the research. Also, he can gather data collected and evaluate it competently. David Hertz makes a clear distinction between the manager in basic research, as compared with a manager involved in applied research. He says, "There is no reason to expect a manager, in the economic sense, to know whether an electronics engineer is, in fact, a good tactician who can deal with observations that he makes in skillful way ... but the scientist manager is a different story ... the scientist managers are fighting such battles to wrest information from nature. These are not easy tasks. Each resource used to obtain one objective means that this particular resource cannot be used at the same time to obtain another objective. Thus the development and assignment of resources to alternative use is of paramount

28) Hertz, pp. 18-19

importance in scientific endeavor." 29

Let us review briefly the problems involved in establishing management policies for basic research in industrial research organizations. First, by the very nature of basic research -- a search for knowledge without regard to practical applications -- it would be exceedingly difficult in the underdeveloped countries of the world for such research to be financed by private industry. While foundation grants could be made, by and large, research of this type would require subsidies from the government. But due to the nature of the kinds of people involved in this research, problems would quickly arise if these scientists received directions from non-professional people. If there were political considerations involved in such research, it would meet with stiff opposition from the researcher. It is fair to say that such scientists would demand a maximum of freedom of activity in research, and a minimum of accountability and restriction. Of course, the degree of loyalty to the organization would vary with the individual researcher and his culture. But researchers are primarily work or discipline oriented rather than organizational or politically oriented. The literature on this subject reveals that managers involved in basic research should also be scientists or basic researchers, preferably senior in age and experience. Needless to say, their administrative duties should be held to a minimum; and with basic research this is possible because it is difficult to predict what break-throughs will be made.

While it is implied that the well chosen manager-scientist will offer the basic researchers under his administration greater motivation, one writer points out that, it could well be that motivating researchers to higher performance is largely beyond the control of managers. 30

29) Hertz, p. 21

30) Earl B. French, Perspective: The Motivation of Scientists and Engineers, Journal of the Academy of Management, June, 1966, Volume 9, Number 2, p. 155

PART III - APPLIED RESEARCH, DEVELOPMENT, AND TESTING ON PRODUCTS AND PROCESSES

Basic research represents only a small percentage of the work done in industrial research organizations. Most of the work done in these organizations is in applied technological research in design, production processes, analysis and testing of materials, development of new manufacturing processes and materials, development of sources of power, development of agriculture, forestry and fisheries.

Although applied technological research is vitally required by manufacturing enterprises in under-developed countries if they are to grow and prosper, most of the firms, which are small and typically hire less than one hundred persons, frequently do not have the funds to make even modest outlays for applied research. Applied research requires the purchase of special equipment and the hiring of researchers, and both are costly. These companies must frequently look to industrial research organizations, particularly those financed by the government, for guidance and support. If the industrial research organization is efficient and effective, its contribution to economic development is increased substantially.

IMPORTANCE OF TECHNICAL LIBRARIES

A basic management policy that should be instituted by any industrial research organization is to install and maintain an adequate technical library. Briefly defined, a technical library is made up of books, pamphlets, treatises, pure and applied sciences, industrial arts, and technology. Because science and technology are cumulative, the sum of knowledge is based upon the contribution of many contributors over many years. And research can advance in this age because of the work of others in past ages. As Coleridge put it, "The dwarf sees farther than the giant; when he has the giants' shoulder to mount on." 31

31) Samuel Taylor Coleridge, The Friend, Essay 8

In the field of chemistry alone, chemical abstracts indexes and abstracts appear in more than 7,000 journals. A hundred years ago there were several chemists, including Remsen, in the country who were reputed to keep up with every article published in the world's chemical journals. Today, it has been calculated that if a man were to devote his entire time to reading chemical literature, and were to spend eight hours a day, five days a week, for an entire year .. at the end of this time, he would be ten years behind schedule. 32

A major problem facing industrial research organizations is not whether information is available, but where it is, and how to find it. Because of the proliferation of technological research taking place throughout the world, there are numerous instances of duplication of effort. Perhaps, this is brought about by lack of good indexes, or from the onerous tedium that researchers associate with a search of the literature in their fields. Managers of industrial research organizations will find that a policy which provides for a competent librarian and staff can be invaluable in assisting researchers on obtaining pertinent materials on his research work. It is the writer's view that sound management policy would require the extensive purchase of books and professional journals related to the kinds of research performed. From a practical point of view it is necessary to recognize that funds for such materials are limited, and in general, these materials are expensive. But they perform three exceedingly important functions. First, they serve as a reference material for researchers and provide new insights on research. Second, they can be read for information by researchers and engineers employed by private or government owned companies. And third, not infrequently these materials can assist in preventing the initiation of projects which have been done before, and the

32) Joseph C. Shipman, Other Sources of Technical Information, Proceedings of the President's Conference on Technical and Distribution Research. For the benefit of Small Business, U.S. Department of Commerce, 1957, p. 94

solution published freeing the researcher and the engineers to work on other problems.

ORGANIZATION

Before peering into the persons interacting in the industrial research organization, it is worthwhile to look at organization itself. Because of the complexities of research today, it is common for research to be assigned to teams of researchers. It may, in fact, be assigned to many different teams of researchers before the research is completed. While by cultural background some researchers are more able to work in groups than others, and therefore, more readily accept group activity. It is safe to say that almost all researchers despite different cultural values seek some recognition of their individual contribution.

As Simon Marcuson puts it, "While the laboratory is engaged in making an employee out of a scientist ...What it is really concerned with is motivating his as a scientist towards optimum goal attainment. The key to this objective, I would suggest, is recognition." 33

To solve the problem involving a lack of recognition for deserving employees Daniel Roman suggests a work management system as part of the solution. He defines work management as nothing more than planning operational objectives, delegation of authority and responsibility for performance, and subsequent information feed-back for control. 34 To determine how successful such a programme of vigorous research might be, let us look at the characteristic and problems facing managers and researchers in applied research and development.

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- 33) Simon Marcuson, The Professional Commitments of Science in Industry, Research Management, Volume 4, Number 4, Winter, 1961, p. 273
- 34) Daniel D. Roman, Project Management Recognizes R & D Performance, Journal of the Academy of Management, March, 1964, pp. 9-10

RESEARCHERS AND MANAGERS

In discussing the researcher-research manager relationship on basic research problems, it was not difficult to see the advantage of a senior researcher being the manager. The results of such research are highly unpredictable, and planning and control can only be applied in a very loose sense. But as we move from basic to applied research results, and from applied research to development,³⁵ the results become more predictable and the planning tighter. And more emphasis must necessarily be given to selecting a manager who has administrative abilities.

A fundamental problem facing most industrial research organizations in under-developed countries is locating and developing capable managers of applied research and development activities. In some ways, under-developed countries can obtain scientific and technical researchers with less difficulty. During the past decade, thousands of students have been sent from the under-developed countries of the world for scientific and technical training to the leading industrial countries of the world. Because of the rapid developments in science these students have in their specialized area most of the latest skills and techniques. They have had little time to broaden their education because they have had too many courses in science and technology. While it is true that many do not return to their countries, a large number do. In the years ahead, more students will be sent for training, and more will return. And because frequently new sciences and technology have obsoleted the old or never existed before, these young researchers are able to assume leadership in their areas of interest and competence.

35) David Novick tells us, there is a thin distinction between applied research and development. He notes that in applied research the knowledge obtained from basic research is identified with a view to developing new devices or methods for specific potential or application. Development results in the establishment of do-ability and the special devices or methods must be brought reasonably close to final application. See Novick, p. 14

It is the competent research manager who is difficult to find. What the young researcher inevitably lacks is not knowledge, but wisdom. And, in the main, wisdom must be obtained from experience, and not from the classroom. But generally, the persons with the wisdom required do not have the education and background to meet the challenge of the research institute's problems for the present and future.

Perhaps, the answer to the problem lies in requiring all research managers to have the same background and education as the researchers. With one extra requirement - that managers also receive training in administration. With such a plan, would better relationships be established as a result of better communication?

This does not appear to be the case ... The great similarity between research and development managers and subordinates often results in either, (1) friction between the manager and the researcher; or (2) virtual lack of managerial control of the research and development function. ³⁶

To paraphrase Lawrence Steinmetz, an interesting phenomenon occurs once the research manager assumes his position.

Because by the nature of research, industrial researchers are continuing their education either formally or through their work activities. But once a man is placed as a project director, he falls behind since he can no longer devote full time to research. In brief, he can no longer remain technically up-to-date. An unfortunate consequence is friction between the manager and the researcher. If the research manager elects to keep up in his field, he must neglect in some measure his managerial responsibility. Thus, the manager finds himself either devoting little or no time to the managerial control of his organization, or he must allow himself to be out-stripped professionally by his subordinates.

³⁶ Lawrence L. Steinmetz, The Research and Development Manager's Dilemma: Fact or Fiction, Journal of the Academy of Management, June, 1966, p. 146

The manager finds himself confronted with a dilemma. "On the one hand, he feels he is faced with a loss of professional respect from his subordinates; on the other, he is confronted with the prospect of being an ineffective manager." ³⁷ It is small wonder why managers feel they have a most difficult job.

A rather complete and comprehensive paper, which will be paraphrased for this report, was prepared by C. W. Churchman and A.H. Scheinblatt on the relationship between managers and researchers. While their report is based principally on the relationship of management scientists and managers, and perhaps, should be included not under applied technical research but economic and business management, the concepts described are highly applicable to applied research. In fact, as will be seen later when an analysis is made of economic and business research, the Churchman-Scheinblatt paper is more relevant to applied science in under-developed countries than it is to business management or economics. Only one word of caution is needed. In general technical proposals are probably more easily accepted by managers than administrative proposals. Consequently, Churchman-Scheinblatt may present at times extreme examples of research-management problems.

This paper brings out four distinct concepts, the separate function position, the communication position, the persuasion position, and the mutual understanding position. ³⁸

The separate function concept considers managers and researcher as essentially separable. The task of the scientist is to prepare as complete a plan as possible taking into account as many aspects of the problem as possible, and conforming to the standards of scientific research. The

³⁷) Ibid., p. 147

³⁸) For a fuller treatment of the subject, read C.W. Churchman and A.H. Scheinblatt, the Researcher and the Manager: A Dialectic of Implementation, Management Science, Volume 2, Number 4, February, 1965, pp. 869-887

complete plan is then presented to the manager whose responsibility it is to accept, or reject what is proposed. In short, the researcher must consider the detailed operational phases of the research he recommends, and lay down the specific steps to be taken.

The communication concept argues for more understanding on the part of the manager for creating better lines of communications. But to have the manager understand the scientist requires much more than having the manager accept the recommendations. The manager must understand what the scientist is trying to do, and why he acts as he does. The problem of carrying out the solution for this concept is to make the manager more of a scientist.

The persuader concept reasons that the researcher must learn to understand the manager since the manager is too busy to understand the researcher. With this knowledge the research can overcome managerial resistance to change, per se, alter specific managerial attitudes, or persuade managers to accept recommendations.

Finally, there is the concept of mutual understanding which embraces the positive aspects of the previous positions. The mutual understanding concept argues that science and management cannot be separated. The manager only understands the researcher by becoming something of a researcher; the researcher only understands the manager by becoming something of a manager.

The work of Churchman and Schainblatt brought out considerable reaction from persons interested in the subject of researcher and managers. As might have been expected, the two authors in a subsequent article attempted to define "mutual understanding". Most of the commentators agreed with the authors that the concept of mutual understanding was the only plausible one of the four. Fred Hansmann clearly focuses on this point, "Although the authors of the paper have qualified the meaning of "mutual understanding", it still seems hard to see how anybody could seriously advocate any other of the four positions considered in the paper. In fact, I am convinced that all authors that have been quoted in connexion with one or the other position would view that they have said as steps in the direction of mutual understanding as defined in the present paper. After all, mutual understanding cannot be built in one step. In my opinion, it is not so much which position should be the preferred one as how to get there. If all earlier attempts are viewed as attempts to move in the direction of mutual understanding,

then I wonder if the present investigation has brought us any closer to the goal desired by all." 39

In a later article Churchman and Schainblatt made a distinction between mutual trust, mutual understanding, and mutual appreciation. Trust, they assert, implies an assuredness in another that transcends, waives, or even violates the relevant evidence, yet an assuredness that forms the basis for some course of action. Mutual appreciation only alleviates certain types of anxieties that exist in each others minds. Researchers and managers who merely appreciate each other can hardly be considered to understand each other. They suggest that understanding begins when the researcher regards his own-day-to-day decision as managerial decisions, and the manager sees how his own activities can be construed as a type of inquiry. 40

Even the definition of "mutual understanding," as previously mentioned, does not provide a clear cut solution to the communication barriers brought about by language barriers, value, and personality conflicts. A quote taken from a commentary amplifies this point, "This definition is not inherently useful to us because it produces (and is the product of) circular reasoning. Since "mutual understanding" is said to exist when an effective output is obtained, then it cannot be helpful to conclude that "mutual understanding" is the state required to obtain an effective output.

The researcher and the manager are treated by this definition as though they were hidden somewhere within a black box. The relationships (or circuitry) that can describe "mutual understanding" are not delineated. Yet,

39) Fred Hanssmann, Commentary, Management Science, Volume 12, Number 2, October, 1965, p. B22

40) C.N. Churchman and A.H. Schainblatt, On Mutual Understanding, Management Science, Volume 12, Number 2, October, 1962, pp. B41-B42

what we want to know is how to "wire" the manager and the researcher together so that an effective input-output relationship is achieved." 41

Starr gets to the heart of the matter in seeking methods by which a mutual understanding could be obtained between researchers, who, as a group, think in terms of individual virtues such as, intelligence, originality, perseverance, and above all, intellectual honesty in carrying out research, and managers, who think in terms of group virtues such as, loyalty to the organization, conformity, willingness to compromise, and keeping people feeling that they are useful in working toward important objectives. Certainly, a step in the right direction towards mutual understanding will occur when researchers and managers, alike, recognize that a manager's job is more political than professional. But first it is necessary to describe "political" as used in this context.

In a provocative article titled, THE MANAGEMENT POLITICIAN, Stephen B. Miles, Jr. describes a manager who is politically oriented as a man who identifies himself with the organization and subordinates his private personality to his organizational personality. He points out that in the years ahead leadership will be divided between (a) the professionals, whose forte consists of ideas, analysis, and problems-and-answers, in situation where there is usually a right and wrong course; and (b) the politicians/managers who seek to build up, maintain, and tend organizations which they then will represent, through activities to which it is almost impossible to apply sharp distinctions of any kind, except possibly between success and failure. 42

41) Martin K. Starr, Commentary, Management Science, Volume 12, Number 2, October, 1965, pp. B30-B31

42) Stephen B. Miles, Jr., The Management Politician, Harvard Business Review, January-February, 1961, p. 100

The scope of this report does not permit further emphasis on the theme, "mutual understanding", nor will this theme reappear in the next section on economic and business research, although it doubtless exists. It should suffice to say that these disagreements whether between basic researchers, applied researchers, or business researchers and managers are known in the literature as conflicts in the information subsystem. A Comprehensive study of them has resulted in the development of a central hypothesis called the "goal sharing hypothesis." It is stated as follows: "Other things being equal, perceived disagreement between two individuals will increase with differences in goals and with increasing interdependence of their formal roles."⁴³ Rate interdependence is defined by Louis Pondy to mean the measure of the extent to which a person in one position depends on a person in another position for work impetus or decision premises: it is a measure of the inter-connectedness of the organization.⁴⁴

THE ROLE OF THE DIRECTOR

Until now we have been dealing with research managers rather than the head of the industrial research organization - the director. The time has now come to consider his role. Although many of the conflicts that take place between researchers and research managers are also applicable to the director of the industrial research organization, there are also distinct differences. If, as we have mentioned before, the project manager must have a political view, the director must have an even greater propensity and aptitude in this area. If the industrial research organization is to be successful, the director must be absolutely dedicated to organizing

43) Louis R. Pondy, A Systems Theory of Organization Conflict, Journal of the Academy of Management, Volume 9, Number 3, September, 1966, pp. 248-249

44) Ibid., p. 249

and promoting the institution. His own personal goals must be subordinated to organizational goals.

He must recognize that one of his major activities is co-ordinating human effort. It is his task to make certain that his industrial research organization recruits the best scientific, technical, and managerial talent available. He must know the personalities of his key people and work towards bringing about the "mutual understanding" discussed at length in this report.

If many of the researchers are professors affiliated with universities in the country, as is often the case in under-developed countries, he must don his political hat and maintain good relations with university presidents and other academic officials. At the international level he must insure that liaison with foreign personnel and foreign industrial research organizations is maintained so that valuable information and assistance can be obtained for his staff.

The paths of authority pass from the director, who determines in large measure policy, to the research managers, who are responsible for the performance of policy, to the researcher, who carries out the research.⁴⁵

By being, therefore, in the best position to know the total nature and structure of authority of the organization, the director can make decisions that are consistent with the organization's objectives.

The director must make sure that his organization is formalized and boundaries exist for the roles of all of his employees. Elliot Jacques and Wilford Brown in their Glacier Studies emphasize this point. "One of the things that has emerged from our research project is such a mode of description. We have observed that the occupant of any role has to carry out

45) This approach to paths of authority is analogous to explanation provided by Edwin Haskell Schell, The Techniques of Executive Control, New York, McGraw-Hill Book Company, 6th edition, 1946, p. 57

certain prescribed tasks and must use his judgement within boundaries set by policies to make specific types of decisions. Whatever the level or nature of work carried out by people, it involves the use of personal judgement ... Just as people in our society need and bring into existence institutions and laws, so the needs of the individual in industry require the institutions I have listed above. In the absence of a clearly structured system of roles and definition of the work allocated to each of them, there is too little creative freedom for the individual because he works within a halo of uncertainty." 46

It is absolutely necessary that the director give the utmost attention to research programmes in order to enhance research effectiveness. The literature on research and development organizations makes it clear the reasons for high mortality in research and development work. Few projects fail because of technical reasons. By and large, the technical ability of R & D personnel is excellent. Most research projects fail because the project concept was wrong in the first place. For example, the project did not fall within company fields of interest, the timing was bad, or people did not want to buy the resulting product. In most cases, these bad research investments spring from faulty project selection. 47

The director must encourage his managers and researchers to ask many questions at the outset of a project on applied research. To list a few: (1) What is the purpose? (2) What information is needed? (3) How much will it cost (?) What is the possibility of success? As William F. May tells it,

46) Wilfred Brown, A Critique of Some Current Ideas About Organization, California Management Review, Fall, 1963, Volume 6, p. 5

47) C. Wilson Randle, Selecting the Research Program: A Top Management Function, California Management Review, Winter, 1960, Volume 2, Number 2, p. 11

"There is no more important function than the suppression of proposals for unneeded action." 48

Finally, the director must have the wisdom to understand that the very purpose of his organization is to bring about change. These changes may be in products, processes, or in solutions to management and economic problems. The plans of the researchers will always be open to question such as, is the research too costly, is the methodology fully understood, has the research been tried and failed elsewhere. And doubtless, disagreement will exist between research managers and researchers.

In the final analysis the director is responsible for establishing or improving the operating systems of his organization. This task is extremely delicate, since for existing organizations it must cut across established organizational functions. It is readily discernible that to be a developer of a system, or an implementer requires a creative, analytical person which are essential characteristics of the efficient director. By the same token, he must understand clearly the informal systems of personal networks and group pressures that exist side by side with formal systems.

If there is too much disagreement, research projects may never be initiated. And yet on the other hand, too much harmony of thought can lead to intellectual sterility. It will be the director's role to know that level of disagreement that is healthy for the organization, and that level which can result in seriously damaging the organization's effectiveness.

So much for applied research, development and testing on products and processes. We now must pass on to research in economics and business.

48) William F. May, Research into Research, Michigan Business Review, March, 1966, p. 3

PART IV - RESEARCH IN ECONOMIC AND BUSINESS MANAGEMENT

Let us begin this section by making a distinction between economic and business management research. We will simply state that economic research will deal with problems related to the national economy (Volkswirtschaft), and business management with problems related to responsible managers of business firms and the business economy (Betriebswirtschaft). These two types of research can be joined together in one research organization, or they may function as separate organizations. For purposes of this report the two activities will be treated together. Because the writer's training and experience are in business management research, most of the materials in this section will focus on business management. When there are significant differences between the activities of economic and business researchers, the writer will mention these differences.

It is safe to say that economic and business management research organizations will perform one or more of the following activities depending, in part, whether the organization is government sponsored, university sponsored, or privately owned.

- I. Research and Surveys
- II. Business Consultation
- III. Training and Lectures
- IV. Top Management Seminars
- V. Publication of Books, Periodicals and Pamphlets

These activities will be reviewed in an effort to examine present procedures, and to seek effective guide lines and management policies.

RESEARCH AND SURVEYS

Research by industrial research organizations should perform two important functions. First and foremost, it must be useful to business managers. Second, it must be used as a training device for businessmen and students. While in developed countries business research may have appli-

cations for the distant future, it should be emphasized that with few exceptions research in developing countries should have more immediate applications, primarily because most companies are small and do not have funds for long range research. Business executives are oriented to the short run and must see short run results before they will place much faith in research.

It has been alluded to in a previous section and is worth repeating here. It would be a crucial mistake, if researchers attempted to apply many of the research tools and techniques which have been applied in highly developed countries. These tools and techniques, consisting of computers, mathematic techniques and special terms and phraseologies are often too expensive and esoteric for application to most of the problems businessmen face in under-developed countries. The problems involved in operating large refineries and fertilizer plants and problems related to economic planning are notable exceptions.

Even in the United States many of the quantitative business management techniques are not used because of difficulties in the language as mentioned by Professor McNaughton of the University of California. He stated, "One reason businessmen do not apply the scientific approach to the management of people more than they do can be attributed to their inability to understand the scientific jargon. To the businessman, the researcher speaks an alien tongue. So, even if a manager were sympathetic with the work being done by social scientists and succeeded in finding the reports of their investigations, he probably would quickly become disillusioned. This is true because of the passion of scientists to impress their colleagues, and their indifference with respect to the use made of their research. This criticism is chiefly leveled at the "pure" scientists although the "applied" scientists are far from being blameless." 49

49) McNaughton, Wayne L, Application of the Scientific Approach in the Management of People, Academy of Management Proceedings of the Annual Meeting, Washington, D.C., December 29, 1959, p. 89

Researchers must become familiar with the kinds of problems managers are facing, and then attempt to find what tools they have at their disposal that can be applied to these problems. Too often, the researcher will attempt to use techniques that he has learned; often in foreign universities, but which are not applicable in solving the problem. What is needed is for the research to be problem rather than technique oriented.

Researchers should have the ability to adapt and simplify many of their management techniques and concepts in order that they can help managers of companies in their countries make decisions in a manner that is effective and efficient at a minimum of expense. In doing research, of course, they can apply such methodologies as, statistics, work studies, general and cost accounting, market research, etc., but these techniques must inevitably be simplified in accordance with the data available and the funds available for the research.

A. J. Grossman presents a provocative, yet a stimulating approach to the activities that a researcher needs to perform to be successful. "In the 'search', the researcher must seek out the evidence ..the 'facts! For example, the economist must be aware . of economic laws, the assumptions upon which they are based, the conditions under which they are applicable, etc. to gain historical perspective of a current problem. In the 'creations! the researcher must personally involve himself. He must use his knowledge, imagination and insight to immerse himself with sympathy, empathy and compassion in the problem that he is addressing. Finally, in the "evaluations', he must use his philosophy, his metaphysics and his ethics to bring the problem into focus.. to relate the problem to the larger system that he has accepted as his desire as to what 'reality' ought to be. He must do this if he is to resolve the problem justly and equitably.

"If the researcher is successful in balancing the three aspects, he attains the sense of the whole that appears to be essential to doing truly effective work. If he subordinates the 'search' to 'creation' and 'evaluation', he becomes the dilettante whose creditability is subject at least to question. If he accentuates the 'search', emphasizing 'facts' without proper context or value, he becomes the technician, so characteristic

of our unlearned society, who does not lead. This is the technician who may be replaced by a device as a matter of efficiency. It is unlikely that the researcher will be outstanding in the three aspects of his work. But he must strive at the minimum to balance them." 50

It is the writer's belief that types of research under-developed countries should conduct becomes more discernible, when a brief analysis is made of the different stages management research has undergone in the United States. The first stage was an attempt to describe the kinds of activities taking place in business organizations. The second stage was through empirical methodology to isolate problems of companies and industries by means of business cases, and then to analyse these cases. At present, emphasis is being placed on establishing, through mathematics and computers, decision rules and principles. Although quantitative techniques coupled with the use of computers can have only limited application in developing countries, making contacts with industry and government by conducting surveys, observing and discussing business problems of managers, and writing case studies provides the researchers with solid material to work with. And it is essential that researchers obtain basic data and information before any kind of analysis can be made.

Researchers in business and economics must first begin a research project by scanning the literature on the subject, and gleaning from it materials which are pertinent to the subject. It is a common fault in under-developed countries to lack proper indexes on materials written in business and economics. For example, this writer noted several years ago that in the Republic of South Korea there were numerous industrial research organisations carrying out business and economic research. Yet, it was startling to learn that no annotated bibliographies or index had been compiled, and few attempts were made by the research organisations to learn what types of research their competitors were doing. Consequently, research

50) Harold F. Smiddy, Research and Shopping - The future of Management, Academy of Management Proceedings of the Annual Meeting, December 29, 1959, p. 34

tended to be non cumulative. At the behest of the author an annotated bibliography was published and distributed to research organizations and universities throughout the country. It is interesting to note that many of the researchers in business and economics considered an annotated bibliography or index as being non-scholarly. While there is some substance to this view, the fact remains that the availability of annotated bibliographies and indexes enhances significantly the potential for a researcher to do creditable research.

Although a variety of research methodology can be effectively applied in the under-developed countries, in my view, what is needed most is basic empirical field research. There are, doubtless, good reasons why most industrial research organizations have not carried out extensively this type of research. Many lack the proper education and training. Many times, the norms and values of the country prevent asking questions which might prove embarrassing to the businessman. In addition, businessmen are not willing to cooperate fully with the researcher.

It has been the writer's observation that industrial research organizations are able to get more cooperation when working with the largest companies in the country, or government companies and agencies. The researchers are introduced to the problem quickly and given assistance in defining the problem, gathering data, interviewing and observing employees and managers. This empirical based type of research applies either to a single problem area, or large companies and institutions.

Another typical type of empirical research that seems to be accomplished with reasonable efficiency is the compilation of descriptive statistics. Such information would include, the number of companies in a country in different industries, or the number of companies employing less than one hundred employees. One industrial research organization, with which the writer has been closely associated, conducted such surveys as, (1) a survey of participants in technical training abroad programmes, (2) a survey of foreign aid projects, (3) a survey of technical manpower resources, and (4) a small and medium business index. These surveys required the

employment of ten professors, who served as the designers and supervisors of the research, and approximately three hundred students, who went out into industry and conducted the surveys. It should be pointed out in this situation that the research design and methodology used were based on similar designs used in the more developed countries of the world, but adapted to the unique kinds of problems involved in conducting this type of research in Korea. For example, women were not used as interviewers because this is against the norms of the people in the country. Also, some concepts and procedures had to be revised. Yet the researchers and the interviewers gained experience and confidence as a result of these research projects, and their work was highly satisfactory.

Over the past six years this writer has been engaged in the development of business case studies in the republic of Korea in an effort to promote a better understanding of the kinds of problems Korean businessmen face, and add this information to the body of business management theory. A business case may be defined as a collection of facts and opinions about an issue or issues requiring a decision. From the definition it can be seen that a case only presents facts and opinions, and not an analysis. The researchers, therefore, go out into industry and obtain relevant facts and opinions revolving around management decisions. In a sense, this activity is analogous to a motion picture, and the case writer plays the role of the motion picture cameraman. These cases provide the researcher with the materials to make an analysis of specific problems in a company, or on crucial problems facing companies in an industry. The case or cases along with the analysis constitute, in my view, an effective method of business management research. It has been the writer's good fortune to observe the use of case studies in Japan, Korea, and Peru. They have proven to be effective tools for management research, and their use is strongly recommended.

Until now this section has centered on preparation for and methods of doing research. But nothing has been said about significant subject areas. While many subject areas could be enumerated, the writer has elected to concentrate on one, marketing research, which until recent years has been given little consideration in developing countries.

Most developing countries have been production rather than marketing oriented. For the most part, they have been able to sell internally most of the goods they produce regardless of quality. Times have changed. At present, there is a greater demand for better products within the country, and for manufacturers to export more products abroad. These pressures require more emphasis on marketing research.

Astute research organizations are performing marketing research on behalf of individual companies, groups of companies, and government agencies. They seek to provide information for decision makers in local or international markets on such questions as : Who are the customers? What is their disposable income? Where do they live? Who makes the buying decisions? What are their buying habits? Who are our competitors, what are their strong and weak points? Granted, many marketing problems are inter-related to other facets of business. It is essential that researchers and research managers recognize this point in order that the most valid information possible can be given to clients.

What kind of policy is meaningful to researchers carrying on marketing research? There is no set policy, but this writer believes using the administrative process might prove to be singularly effective.

This process requires that the researcher participate in the formulation of problems, as well as contribute to the action that leads to a solution. The interaction of researchers and clients in the administration process consists of (1) setting objectives; (2) developing the plans to achieve these objectives; (3) organizing to put these plans into action; and (4) controlling and reappraising the program that has been carried out, in order to determine whether or not the objectives, the plans, and the organization

are functioning properly. 51

No attempt will be made to discuss this process in more depth. The steps as enumerated provide, if not guidance for policy formation, at least a point of view worthy of more consideration and contemplation.

BUSINESS CONSULTATION

It is not unusual for industrial research organizations engaged in business management to initiate their operations through business consultation rather than business research. Such was the case of the Business Management Research Center of Korea University which was started late in 1958 by two Korean professors and an American professor who served as an advisor. Together, they trained at the outset a staff of eight. Their first major project came in 1960. It was a contract stipulating that the Research Center would provide consultation pertaining to the administration of one of the leading banks in Seoul. The experience and reputation gained from this project resulted in the Business Management Research Center receiving contracts for consultation from other banks throughout the country. About the same time, the Korea Productivity Center, a quasi-government organization, also began doing consultation work. This organization, as was the experience of the Business Management Center, initially met resistance because businessmen were reluctant to pass on business secrets to outsiders. Also, they were afraid that disclosing business secrets would result in heavier taxation. Since those beginning years much of the resistance to business consultation has abated, and both organizations have increase their work in business consultation. Once a research centre becomes engaged in consulting work the research director will be required to settle the question: How much of the

51) Harper W. Boyd, Jr. and Stuart Henderson Britt, Making Marketing Research More effective by Using the Administrative Process, Journal of Marketing Research, February, 1965, p. 13

researchers' time should be allocated to consultation, and how much to research?

It seems, as a general rule, that business management research organizations attached to universities might be advised to hold consultation to a minimum, although more latitude would be given for individual professors. Korea University has followed this policy by placing greater emphasis in recent years on research. On the other hand, government subsidized research organizations or privately owned research organizations would be expected to do most of the consultation work. The reasons for such policies are: (1) Consultation often requires that the finished report be kept confidential which is contrary to the role of the university. (2) Consulting work usually entails working with one company, while the university is required to serve a broader segment of the economy. (3) Professors will often lack the kind of methodology and full understanding of practical skills and experience consultation requires. Yet, before quitting this subject the experience of Korea University reveals that for some university affiliated research organizations, consultation may serve a useful function, although it does present a major risk during the early years of a research organization.

TRAINING AND LECTURES

It is safe to say that one of the most active programmes of government sponsored business management and economic research organizations is the training and lecturing of technicians, engineers, and managers. Courses, lasting anywhere from one or two nights (lectures) or to several months (training), are held to meet professional needs of the participants. Dr. Mostafa Hamdy has done extensive work in this area, and the writer concurs with many of Dr. Hamdy's suggestions. Certainly, adequate and effective training materials are a necessity. And in designing programmes it is imperative that decisions to select, (1) appropriate subjects and materials to meet participant needs, (2) training methods that best emphasize the subject matter, (3) the most competent instructors possible, (4) the proper

sequence of programmes, and time allocated for them. Since it is the function of the research organization to enhance business management training, it follows that the overall training programme should represent "a balance of technological, economic, behavioral, and political factors." 52

In August 1963, an article in MANAGEMENT & PRODUCTIVITY dealt with the problems of teaching management in under-developed countries. Based on ten years experience of the International Labour Organization (ILO) in countries in various stages of development throughout the world, the problem of major concern was: how to insure that what had been taught in training programmes, seminars, and conferences would be effectively introduced into and practiced in industry, and used effectively as part of the normal management practice of the enterprise concerned.

The article discussed four main sets of obstacles. They are listed as follows: (1) Obstacles due to conditions in the country or industry permanently or temporarily outside the control of the managements concerned. (2) The attitudes of top managements. (3) The attitudes of the course participants themselves, whether or not they have the ultimate power of decision. (4) Ineffective transmission of knowledge. 53 In view of the magnitude of this problem, it behooves managers of industrial research organizations to analyze these obstacles cited, and to find ways of reducing them.

It is appropriate to point out, however, that still another obstacle exists. In analyzing related problems that occurred at General Motors Corporation during the mid 30's, John A. Beckett suggests, "The main reason

52) Mostafa Handy, A Tentative Note on Training Management Personnel in Industrial Research Organizations in Developing Countries. 1966

53) Teaching Management in Newly Industrialising Countries, Management & Productivity, International Labour Organization, August, 1963, pp. 1-5

why progress did not move along very fast was the fact that cleaning it up meant establishing improved operating systems, and these inevitably cut across established organizational lines." 54

This cogent observation stresses the importance of perhaps a new perspective in solving operational problems. With or without the use of computers, the systems approach to viewing a problem in management training has meaning and importance. It will occupy a greater role in the future.

TOP MANAGEMENT SEMINARS

At the outset it is essential to define a top manager. As used in this report, a top manager will mean the president of a small or medium sized company, one employing less than five hundred persons, or a president or an executive vice-president of a large corporation. In many developing countries companies, if not owned by the state, are generally small and family owned. In general, there is little delegation of authority. The position of the top manager is frequently highly authoritative. Consequently, any change that is sought in his company must with few exceptions be initiated by him. He is without doubt, the most important agent of change, or reaction to change in his company. Because of the position of power the top manager holds, well planned and well executed conferences held exclusively for top managers have the potential to bring about impressive changes. If the top manager is pleased with a conference, he is more susceptible to learning in greater detail new methods and techniques of management. He may, and often does, send many of his subordinates for training. Industrial research organizations, therefore, have the task before them of establishing a policy that will induce top managers to attend top management seminars, to motivate them while they are there, and to assist them in making changes when change is necessary.

54) John A. Beckett, Motivation and Systemation - New Realities for Industrial Management, University of New Hampshire, November, 1964, p.10

The aim of a top management seminar is to equip each top manager to do a better job in making decisions, and to prepare him to be able to make better decisions in the future. To this end, top management programmes revolve around the decision making function regarding policy, organizing, directing, co-ordinating, and controlling.

To illustrate a point, Washington University of St. Louis assisted Korean universities and government ministries in holding that country's first top management seminar. In a report on the conference the Washington University project coordinator wrote, "The general discussions within the functional areas of business administration were followed by more specific discussions of special problems and by business cases. The use of the case method was an important aspect of the Programme. The case method has proved itself a valuable tool in developing problem solving techniques. The business cases used were developed from actual business situations. The participants analysed the situation and developed solutions for the problem or problems involved. There was then group consideration of the analysis of the various factors in the particular situation and consideration by the group of various possible solutions.

Whether or not there was agreement on a solution was relatively unimportant since there was often more than one adequate solution to a business problem, and the important aspect of the case method is found in the depth of the analysis of the functional factors involved.

Since the Programme was designed as a participation-type programme centering around discussions and case presentations, its success depended heavily upon the qualifications and backgrounds of the participants. The interchange of ideas and information among the participant was, as intended, an important part of the Programme." 55

55) First Semi-Annual Progress Report, February 1, 1958-August 1, 1958,
Washington University Project in Korea, United States International
Cooperation Administration

The primary responsibility for the programme rested with the American university. It is interesting to note that conferences have continued, and last year required no outside assistance from foreign advisors.

It has been the writer's observations over the past seven years in working in top management conferences that certain fundamental policies must be followed by the research organization. They are:

(1) That only top managers, as defined, be invited, and there should be no exceptions.

The reason for this policy is that top managers want to be with persons of the same status and rank. In case discussions, for example, and in raising questions, they do not wish to be embarrassed by persons in lower positions in management. Also, it is healthy for them to interact outside of class with men of the same position having comparable problems. To insure the proper executives attend close co-ordination may be necessary with the government and the business community.

(2) Conferences be held for no longer than two weeks, and probably average about one week.

If this rule is not followed, it will be difficult to keep top managers at a conference. Their work will demand that they return to their companies. There are exceptions to this rule.

(3) Top managers should be exposed to the broad decision making policies and techniques applied to business management.

At the end of the conference they should see how materials presented fit in with the total operation of their company. Individual lecturers can concentrate on special techniques, but again the lecturer must be able to show the relationship of the technique to the overall management of the company.

(4) Top managers should interact frequently with each other after classes to discuss problem assignments.

It is imperative that they be kept busy and away from outside influences. If not kept busy they will lose interest in the conference, and often seek

diversified activities. Normally, such conferences are held in spas and resorts so that the executive will not be going back and forth to work, or receiving telephone calls on business problems. The purpose of the conference is to allow them reflection and indoctrination to new concepts.

There are many more policies that could be mentioned, but those listed cover the essential points. The time has come to leave this subject, but before doing so it is necessary to reiterate the concept that unless the top manager accepts change, it will be difficult for his subordinates to bring it about. He is the prime target for any research organization interested in furthering management development.

PUBLICATION OF BOOKS, PERIODICALS, AND PAMPHLETS

Needless to say after a business management and economic research organization has conducted one or more of the following activities: consultations, research, lectures, training programmes, and top management programmes, publications such as, books, periodicals, and pamphlets are to be encouraged. The basic reason for such a policy is simply that these publications make the results of consultation, research, etc. available to many. The question of policy, therefore, is not, should the research organization publish, but what should it publish, and how much?

This question must be settled, the writer believes, on pragmatic grounds. That is, it depends on how much money the organization has for publishing, the prospects of selling the publication, the amount of material that has general interest and yet is not confidential, and the staff and facilities available for publishing. The director of the organization and his staff must consider these questions and seek a solution that best serves the organization's needs and objectives.

PART V - GENERAL OBSERVATIONS AND CONCLUSIONS

This study has been concerned with management problems in industrial research organizations in developing countries. The challenges that confront these organizations along the broad frontiers of science, technology, and

management must be answered with sound management policies and capable administration.

It is an awe-inspiring task that executives of these organizations are required to face. They must be prime movers in developing rapidly many new technologies and methodologies in their countries. And at the same time, they cannot ignore thinking about conditions in the future to guide them in their long range planning. Upon the soundness of policies generated today will depend, in large measure, the future of the organization, companies affiliated with the organization, and the nation itself.

The writer is convinced that the management problems in industrial research organizations can be brought progressively closer to a solution if conscientious research is applied to research organizations themselves. These organizations are analogous to a medical doctor who spends so much time attempting to cure the ills of others, he neglects his own health. This report, which by design is broad in scope, should afford researchers the opportunity to pick out one area and explore it in depth. Doubtless, one important function of this particular report has been an attempt to point out and define major problem areas. The bibliography provides background materials for a fuller understanding of the subject.

It scarcely needs statements that conclusions and recommendations bearing on specific activities have been presented in the body of this report. Also, several of the more salient points have been enumerated in the abstract. They serve as guides to management action, but in themselves cannot bring about striking results. In the final analysis, only the motivation, intelligence, dedication, and far sightedness of researchers and managers employed by the industrial research organization can bring about the desired objectives.

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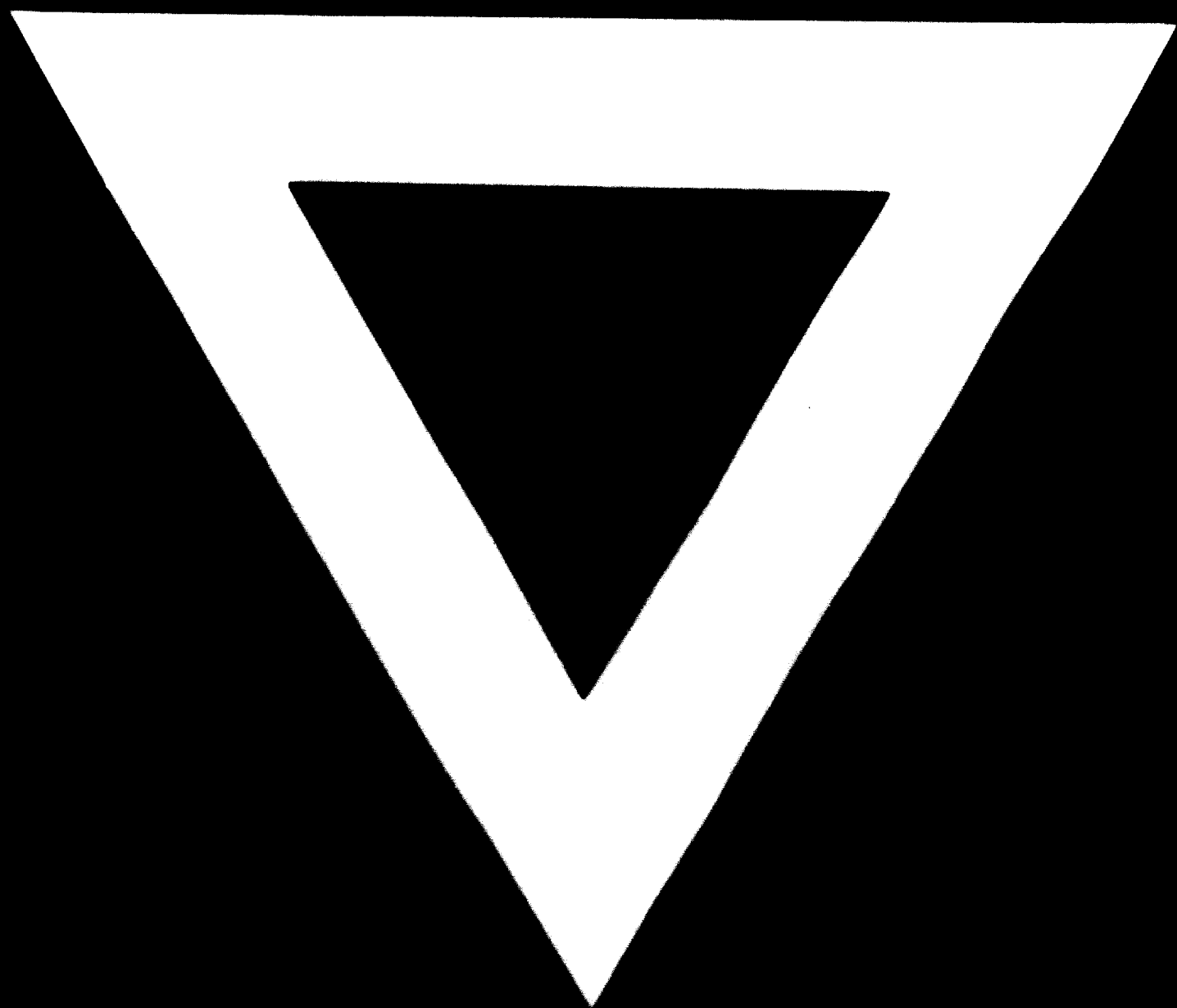
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