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A REVIEW OF  
PHYSICAL DISTRIBUTION MANAGEMENT

By

Conrad Joseph Hanson

B.S. Montana State University, 1962

Presented in partial fulfillment of the requirements for the degree of

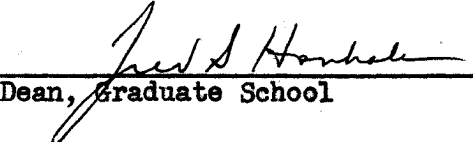
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## CHAPTER I

### PHYSICAL DISTRIBUTION IDENTIFIED

#### Introduction

Physical distribution is an important subject for three reasons: (1) the magnitude of physical distribution costs; (2) the great potential cost-savings which may be realized under effective distribution management; (3) the fact that physical distribution is a major function of business activity requiring a philosophy and a plan or organization to cope successfully with all its elements.

First, distribution will be defined, and then broken down into its major elements. Next, the magnitude of distribution costs will be established. From here, the big problem facing many firms, that of decentralization and dispersion of distribution activities, causing inefficiency, high costs, and general confusion, will be introduced. This will be followed by a discussion of the standard, old-style distribution system. For this discussion, an organizational chart will be used as an illustrative aid. Organizational charts will also be used to illustrate the realignment of the distribution function taking place throughout the business world. Next, a presentation of the evolution of a distribution system will be made. To tie in, and lend reality to the material covered up to this point, a short case study of the Pillsbury Company's Grocery Products Division will be discussed. Following this discussion will be an outline, or checklist, which may be used for a balanced review of a physical distribution system. Lastly, the



widespread support of the concept of organizing for a separate physical distribution function, by noted authors, business periodicals, industry, and the Federal Government, will be reviewed.

The main purpose of this paper is to present and discuss physical distribution as a whole subject at all times. In fact, a common failing (which will be discussed more fully later) of many firms is their inability to grasp the problem of distribution in its entirety. It is felt that there is a trend in the business world today to become overly engrossed with glamorous concepts such as automation, computers, and the like, while the more old-fashioned ideas of good initial organization and periodic review of operations are sadly neglected. John F. Stolle, noted management consultant, states:

. . . business has become entranced with the analytical tools --linear programming, non-linear programming, and simulation, for example--and for good reason, since they add greatly to management's capability. But the very power of these management science techniques is deceptive in that it obscures the fundamental requirement that companies do a better job of organizing and managing distribution activities.<sup>1</sup>

With this in mind, segments of physical distribution, such as order processing, or warehousing, will not be dealt with exhaustively, on an individual basis--to do so would be impossible in a paper of this nature and length. Granted, areas such as order processing merit exhaustive treatment if a firm engaged in distribution activities requiring extensive order processing is to hold down costs and maintain satisfactory customer relations. However, order processing,

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<sup>1</sup>John F. Stolle, "How to Manage Physical Distribution," Harvard Business Review, 45:94, July-August, 1967. Mr. Stolle is presently Vice-President of Management Sciences and Operations Research for Booz, Allen and Hamilton, Incorporated.

warehousing, transportation, and all the other parts which comprise physical distribution vary so much from firm to firm, that to delve deeply into any one of them would very probably result in subject material applicable to only a very few types of businesses. Rather than do this, it is the aim of this paper to deal with the whole subject, to present a prospectus, a review of physical distribution systems, which may be of value to a wide cross-section of businesses and businessmen.

### Definitions

In the marketing world of today, there is much writing and discussion of a No Man's Land<sup>2</sup> in our economy. Such an area exists, also termed the Dark Continent<sup>3</sup> or "The Other Half of Marketing,"<sup>4</sup> by noted authors and businessmen. One might very well ask just what is this seemingly uncharted quagmire into which a business may wander, and sink out of sight? It is the area of physical distribution costs and their management.

Physical distribution may be very simply defined as the connecting link between manufacturing and the final consumer. Possibly the most sophisticated definition is that of the National Council of Physical Distribution Management (NCPDM), which defines distribution as:

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<sup>2</sup>Peter F. Drucker, "Physical Distribution--Frontier of Modern Management," Dun's Review and Modern Industry, 88:21, September, 1966.

<sup>3</sup>Wendell M. Stewart, "Physical Distribution: Key to Improved Volume and Profits," Journal of Marketing, 29:66, January, 1965.

<sup>4</sup>J. L. Heskett, "Ferment in Marketing's Oldest Area," Journal of Marketing, 26:40, October, 1962.

The broad range of activities concerned with efficient movement of finished products from the end of the production line to the consumer, and in some cases includes the movement of raw materials from the source of supply to the beginning of the production line. These activities include freight transportation, warehousing, material handling, protective packaging, order processing, market forecasting, inventory control, plant and warehouse site selection, and customer service.<sup>5</sup>

It is interesting to note that the definition published by the NCPDM indicates that physical distribution management is concerned with market forecasting, and in some cases, the movement of raw materials from the source of supply to the beginning of the production line. There is doubt as to whether the distribution manager should be in charge of market forecasting. Most writers and students of distribution feel that forecasting should stay in the realm of Sales and Marketing, since the selling force is in more direct contact with the demand pulse of the consumer. People in distribution may have a point in claiming the movement of raw materials as their bailiwick, however. Purchasing personnel would still be in charge of arranging and contracting for raw materials, but it is felt that the distribution people would best perform the actual movement, handling, storage, etc., that occurs after the purchase is made.

Referring back to the definition established by the NCPDM, it should be pointed out that not all members of that organization agree as to how physical distribution should be defined. Very broadly speaking, they agree that it covers the problems of satisfying the consumer demand which has been channeled and directed by the marketing personnel.

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<sup>5</sup>Jay H. Bullen, "New Competitive Selling Weapon; Physical Distribution Management," Sales Management, 94:42, May 7, 1965.

Some of the members feel that unless some curbs are placed on the defining of the concept, it will get out of hand, spreading to take in production scheduling, factory location, marketing, and other areas. As one council member said at a recent NCPDM meeting, "If we don't look out, the guy in charge of physical distribution will have to be president of the company." Then, after a moment's thought, he added, "Perhaps that's not such a bad idea."<sup>6</sup>

The definition which seems to be the most concise, and which is accepted by most marketing men without dispute, is that set forth by the Definitions Committee of the American Marketing Association. This definition was established in 1948, and remains in its original form. The Definitions Committee defines physical distribution as, ". . . The movement and handling of goods from the point of production to the point of consumption or use."<sup>7</sup> This last definition will be the one accepted for use in this paper.

#### Magnitude and Composition of Distribution Costs

Physical distribution is obviously important when one considers all the phases of business in which it is connected or involved. Naturally, the most important consideration in all phases is that distribution means cost. This may be a direct dollar cost, such as for transportation, or warehousing, or it may be an indirect cost in the form of customer dissatisfaction.

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<sup>6</sup>"Next Place for Paring Costs; New Area of Physical Distribution Management," Business Week, May 1, 1965, p. 132.

<sup>7</sup>"1948 Report of the Definitions Committee of the American Marketing Association," Journal of Marketing, 13:212, October, 1948.

There is a tendency to think of physical distribution costs as being comprised of transportation and warehousing costs only. Actually, there are other significant costs which must be considered when attempting to analyze and improve distribution activities. The nature of these costs varies with different firms, but the following list includes the common costs associated with physical distribution:

1. Transportation by common carrier, contract carrier, or company-owned equipment.
2. Warehousing in public or private facilities.
3. Order handling, including back orders.
4. Packing.
5. Inventory insurance.
6. Inventory handling.
7. Inventory taxes.
8. Inventory obsolescence.
9. Inventory capital costs.

To illustrate the importance of physical distribution costs, a look at some quantitative measurements is in order. The quantitative aspects presented in this study might, at times, appear to be slightly out of date. Some references go back 5 and 6 years, and it would seem that surely more current information is available. Such is not the case, for one of the peculiarities of studying physical distribution is the lack of current quantitative data. There is no government agency directly concerned with distribution (although there may be one in the future), and only recently was a Department of Transportation formed, which is just now beginning to release information directly relevant to physical distribution (more will be said about the Department of

Transportation and a possible Government Distribution Census later). Because of the complexity of physical distribution, and the apparent lack of any profit incentive, like firms have not organized to compile and publish physical distribution data on a regular, nation-wide basis, and therefore, information presented here is drawn mainly from private studies and surveys, and partly from governmental agencies, such as the Interstate Commerce Commission, when applicable. In considering physical distribution costs, Jay H. Bullen, the Industrial Editor of Sales Management, estimates that almost 50 cents of each dollar the American consumer spends for goods goes for activities that occur after the goods are made.<sup>8</sup> One author, Wendell M. Stewart, states that in the United States, the storage and movement of products from plants to markets is estimated to cost between \$50 and \$75 billion annually, with some estimates running as high as \$100 billion, when inventory carrying and order processing costs are included. Percentage-wise, Stewart reports an analysis of various industries in which distribution costs range from a low of 10 percent of sales in the machine industry, to a high of almost 30 percent in the food industry.<sup>9</sup> A table of physical distribution costs by industry (an average during 1960-1962), compiled by Richard E. Snyder, is illustrated in Table I. An editorial in Business Week reports that distribution costs now comprise the third largest cost of doing business, trailing only the payout for materials and labor.<sup>10</sup> Finally, J. L. Heskett, in an article in the Journal of

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<sup>8</sup>Jay H. Bullen, "An End to 'Headless' Distribution," Sales Management, 85:17, September 16, 1960.

<sup>9</sup>Stewart, op. cit., p. 66.

<sup>10</sup>"New Strategies to Move Goods; Special Report," Business Week, September 24, 1966, pp. 112-136.

TABLE I  
PHYSICAL DISTRIBUTION COSTS BY INDUSTRY

Industry	Percent of Sales
Food and Food Products	29.6
Machinery	9.8
Chemicals, Petroleum, and Rubber	23.1
Paper and Allied Products	16.7
Primary and Fabricated Metal	26.5
Wood Products	16.1

Source: Richard E. Snyder, "Physical Distribution Costs," Distribution Age, 62:35-42, December, 1963.

Marketing, estimates that in the aggregate, physical distribution costs account for 16 percent of the delivered price of all goods consumed.<sup>11</sup> Estimates may vary somewhat, but the magnitude of distribution costs is plain to see. Having taken a look at the size of distribution costs and their breakdown by industry, let us examine the major elements, or functions of distribution costs.

#### Some Major Elements of Distribution Costs

An analysis of major elements of distribution cost is provided in Table II. This information was provided by McKinsey and Company, Inc., which conducted a study of distribution economics and distribution management in 26 large companies which represent a wide range of

<sup>11</sup>J. L. Heskett, "Missing Link in Physical Distribution Center Design," Journal of Marketing, 30:39, October, 1966.

industries, including food processing, chemicals, petroleum, building materials, and fabricating.

TABLE II  
MAJOR ELEMENTS OF DISTRIBUTION COST

Item	Percent of Total
Carrier Charges	44%
Warehouse and Handling	20
Inventory and Carrying Costs	18
Shipping Room	11
Administrative	<u>7</u>
Total	100%

Source: R. P. Neuschel, "Physical Distribution; Forgotten Frontier (survey of varying companies)," Harvard Business Review, 45:132. March, 1967.

The averages in Table II are for the survey sample as a whole, based on available company data and/or the author's estimates. Percentages assigned to various items themselves vary as much as 20 percent either way among the 26 individual companies in the sample.

Another study, labeled "Physical Distribution Costs by Function," was conducted in 1962 (see Table III). Table III illustrates the results of a study of industrial distribution costs and trends in the distribution practices of 270 American corporations, conducted by A. T. Kearny and Company, for the American Trucking Association, Inc., Washington, D. C.



TABLE III  
PHYSICAL DISTRIBUTION COSTS BY FUNCTION

Functional Activity	Percent of Sales	
Administration		2.4%
Transportation		
Inbound	2.1%	
Outbound	<u>4.3</u>	6.4
Receiving and Shipping		1.7
Packaging		2.6
Warehousing		
In-Plant	2.1	
Field	<u>1.6</u>	3.7
Inventory Carrying Costs		
Interest	2.2	
Taxes, Insurance, Obsolescence	<u>1.6</u>	3.8
Order Processing		<u>1.2</u>
		21.8%

Source: Wendell M. Stewart, "Physical Distribution; Key to Improved Volume and Profits," The Journal of Marketing, 29:67, January, 1965.

Tables II and III are the results of independent research, but some comparisons can be made. However, before any comparisons are made, some limitations and qualifying statements must be made about the two studies.

It is realized that for Table II, the individual costs are given as a percent of the total distribution costs, and that in Table III, the individual distribution costs are given as a percent of sales. The fact that both tables present individual distribution costs as a percent

of some real cost figure allows a ranking as to which is the largest distribution cost by function, which is the next largest, and so on. Also, it should be pointed out that because the two studies were conducted independently, it is very probable that different accounting methods and cost criteria were used in tabulating the distribution costs, so that, for example, Inventory and Carrying Costs in Table II does not mean exactly the same thing as Inventory Carrying Costs in Table III. However, the terminology is much the same, so that it may be reasonably expected that the researchers used much the same (but not exactly the same) criteria for establishing the different distribution costs by function.

With this in mind, a rough comparison of the tables can be made. First, both tables indicate that Transportation was the single largest cost element in physical distribution for the firms studied. In Table II, Transportation (called Carrier Charges) was 44 percent of total distribution costs, and in Table III, Transportation (called Transportation, subdivided into Inbound and Outbound) was 6.4 percent of the 21.8 percent which distribution comprised of Sales. In further comparison, both tables indicate that Inventory Carrying Costs and Warehousing are the next largest cost elements in physical distribution. Again, terminology is slightly different. The tables differ in the ranking of these two cost elements (Inventory Carrying Costs is the larger in Table III, with Warehousing next, while Warehouse and Handling is the larger in Table II, with Inventory and Carrying Costs next), but the difference is small.

As indicated above, studies of physical distribution point out that Transportation comprises the largest portion of the cost. With

Transportation as the largest cost area, a look at the changes in Transportation over an 18-year period is in order. Table IV presents a quantitative picture of the changes that have taken place in the field of Transportation from 1946 to 1962..

TABLE IV  
PERCENTAGE DISTRIBUTION OF INTERCITY FREIGHT TRAFFIC

Mode	Percentage of Total Ton-Miles Hauled	
	1946	1962
Railroad Freight	66.6%	43.0%
Motor Freight	9.1	23.8
Water Freight	13.7	15.8
Oil Pipeline	10.6	17.3
Air Freight	less than 0.1	0.1

Source: Adapted from statistics of the Interstate Commerce Commission, Statement No. 6103, 76th Annual Report; Transport Economics, January-February-March, 1963; and the Corps of Engineers, United States Army.

## CHAPTER II

### THE BIG PROBLEM

#### Some Smaller Problems

The last table in Chapter I points out the fact that there have been sweeping changes in transportation, one of the major elements of distribution. For this particular element, shifts in transportation modes have been for the betterment of distribution, but the fact that the situation is constantly changing creates problems in that firms must be continually investigating, exploring, and making vital decisions as to which transportation methods to utilize in order to best accomplish the distribution function. There are rapid changes taking place in other segments of the total distribution picture also, which create complex problems. For example, a problem many firms face is the change in customer order habits. Individual customers are now tending to order more frequently, but in smaller quantities. A fastener manufacturer placed orders for rod and bar stock about eight times a year in 1962, and today places orders monthly.<sup>1</sup> Firms are seeking to cut inventories in order to improve stock turnover, and lessen inventory capital costs. The result is that there is a shift in the responsibility for inventory maintenance backward in the channels of distribution to the manufacturer.

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<sup>1</sup>Jay H. Bullen, "New Competitive Selling Weapon; Physical Distribution Management," Sales Management, 94:46, May 7, 1965.

Another problem is the considerable limitations which have been placed on firms employing basing point and zone delivered pricing systems. Price differentials and discounts must now be cost justified more completely than ever before. This is forcing many companies to determine, perhaps for the first time, their actual distribution costs on individual product groups moving to individual markets and classes of trade, rather than to rely on broad national cost averages.

Still another problem is that of proliferating product lines in terms of color, shape, unit counts, and the like. An example of this can be seen in the General Electric Company: the firm offers some 25 basic refrigerator models to the consumer, in six different colors, with left and right door-opening options, meaning a customer has a choice of 300 variations of the product.

There are many more problems than these in physical distribution. There are order processing problems, inventory handling problems, inventory obsolescence, spoilage, breakage--the list could be extended far beyond the scope of this paper. Rather than become enmeshed in the myriad of individual problems present in most distribution systems, we now want to introduce and discuss the one main problem plaguing most firms engaged in physical distribution today.

#### The Big Problem

The big problem facing many firms today is the problem of decentralization and dispersion in the physical distribution system, which inhibits the necessary focus and concentration needed to develop distribution to its full potential. Progress in improving the efficiency and reducing the costs of manufacturing and production activities in

American business has outstripped similar progress in the area of distribution. Michael Schiff, writer for the Financial Executive, has said:

Too frequently, companies have been organized around the products and manufacturing processes involved rather than around the markets served. The significant influence of the customer on physical distribution operations and related costs has led to a reappraisal of the organization of the physical distribution function.<sup>2</sup>

Peter Drucker, noted author and business consultant, states that:

We have been working for 100 years on costs in the manufacturing areas. I would imagine that 100 years ago, the physical distribution costs were as much as they are today. But the total share in the cost was much less than it is today simply because we have whittled down, and cut down, and slit off so much of the manufacturing costs and a good many others. As a result, physical distribution has become the largest single cost element.<sup>3</sup>

Drucker goes on to estimate that a 10 percent improvement in distribution costs is probably worth a 40 percent improvement in manufacturing costs.

Having identified the problematic crux of physical distribution today, that of fragmentation of distribution activities, let us examine some typical distribution activities. Naturally, business firms have always had to "manage" physical distribution functions. There are many alternative methods of performing each of them. Normally, for example, companies select one or more modes of freight transportation from several alternatives with different costs. Goods may be stored in public or private warehouses. Inventories may be stored centrally or in a

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<sup>2</sup>Michael Schiff, "Controlling Physical Distribution Costs," Financial Executive, 31:14, April, 1963.

<sup>3</sup>Drucker, op. cit., p. 22.

varying number of regional warehouses. Various systems for the handling of orders and back orders are available; different types of packing methods and materials are considered before decisions are made.

Most companies place the responsibility for physical distribution control at the functional level (for example, traffic, or transportation, or warehouse manager). Pressures are applied by top management which encourage the separate functional units to control and reduce their costs of operation. Cost reduction becomes the primary way for these functional units to call attention to themselves. Thus, the traffic manager is motivated to arrange transportation services at the lowest possible cost--probably without pausing, in many instances, to consider that the mode of transportation selected affects the type and cost of packing materials to be used. Say that the packing process is in accordance with the type of transportation being used, resulting in a minimum of breakage and spoilage. However, if a new mode of transportation is selected, perhaps the packing process and packing materials will not be sufficient, resulting in excess breakage, spoilage, and customer dissatisfaction. Looking at it from another angle, it may be that the new form of transportation will require less rigid packing specifications, thereby making possible cost reductions in the packing process segment of the distribution system.

Again, in a case where the traffic manager is interested only in the lowest transportation cost, there will be a concentration on large quantity shipments by truckload or carload lots. Supporting the traffic manager's desire for quantity shipments will be the production planning and scheduling personnel, who think in terms of minimizing unit production costs. As a result, frequently these and other functions

are performed without sufficient regard for the effect of these decisions on other related costs, such as inventory handling costs, capital costs, and that large, dangerous cost area, customer dissatisfaction.

In the case of large quantity shipments, customers may have to wait long periods until a sizeable shipment to their area is made up, thus providing grounds for customers to look elsewhere for faster service.

Recognition and promotion based mainly on cost reduction in the separate functional units, such as that of the traffic manager, the warehouse manager, etc., produces a condition of suboptimization--a condition of apparent efficiency in the various parts, but less than optimum efficiency in the operation of the integrated whole. Thus, there is a need for creation of a separate physical distribution department, with responsibility for coordinating the activities of these various functions and controlling the total distribution costs.

#### A Traditional Distribution System

The logical way for many firms to begin coping with the problem of fragmentation of distribution activities is to reorganize their distribution system. Before studying some representative organizational solutions, a look at a customary, or traditional distribution system is needed.

Let us assume that we are examining a small company which manufactures a bulky, inexpensive, consumer item. It has one factory and two major warehouses, to which it adds a large in-transit warehouse during its busy season. A typical organization chart for a firm such as this is illustrated in Exhibit 1. Only those responsibilities



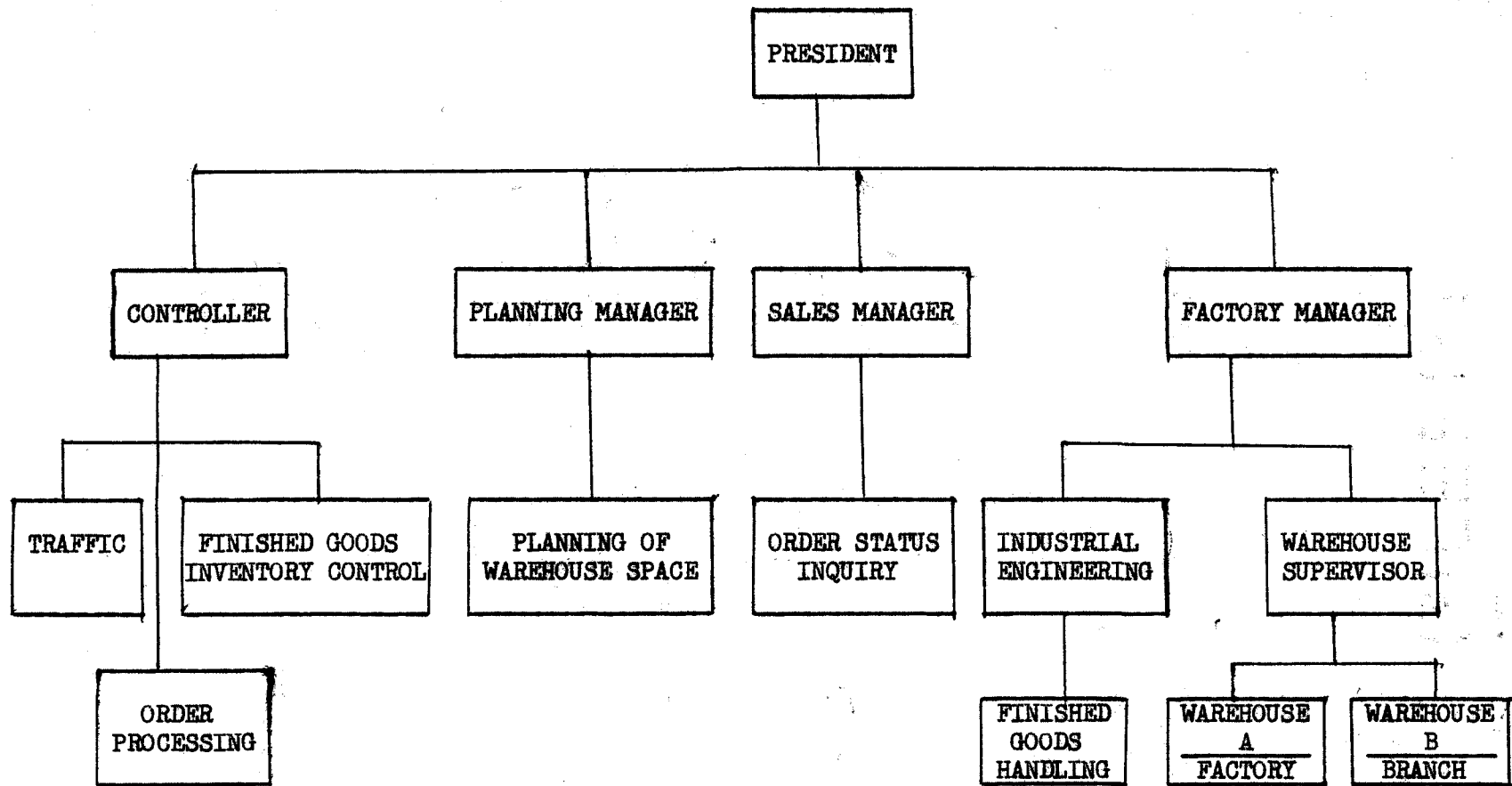


EXHIBIT 1. TRADITIONAL DISTRIBUTION SYSTEM

associated with physical distribution are shown on this chart, but notice how they are dispersed and spread about.

In this situation, almost everyone has something to say about distribution. Coordination is a problem, and every major decision about distribution practically requires a mass meeting. It is difficult to fix responsibility for distribution with so many people involved. The sales manager will very probably have differences concerning distribution with the factory manager, the factory manager with the planning manager, and so on. There is no one person in control of the total distribution function who can coordinate and work out problems and differences.

#### Organizing for Physical Distribution--Small Firm

The logical first step to improve such a situation is to recognize physical distribution as a single, integrated function, and to reorganize with that thought in mind. Exhibit 2 illustrates an organizational set-up which should provide the framework for coordination of the distribution system. There are definite advantages in this organizational framework. For instance, the sales manager is no longer bothered with determining order status, and can devote full time to his prime purpose, which is selling. The sales manager and his salesmen would probably still receive order status inquiries, since they are in the field and in contact with customers. However, rather than having to trace down an order, which may still be in the production process, in Warehouse A or B, or in transit, the sales personnel can channel all their inquiries through the distribution manager.

The distribution manager, in turn, is set up to determine just

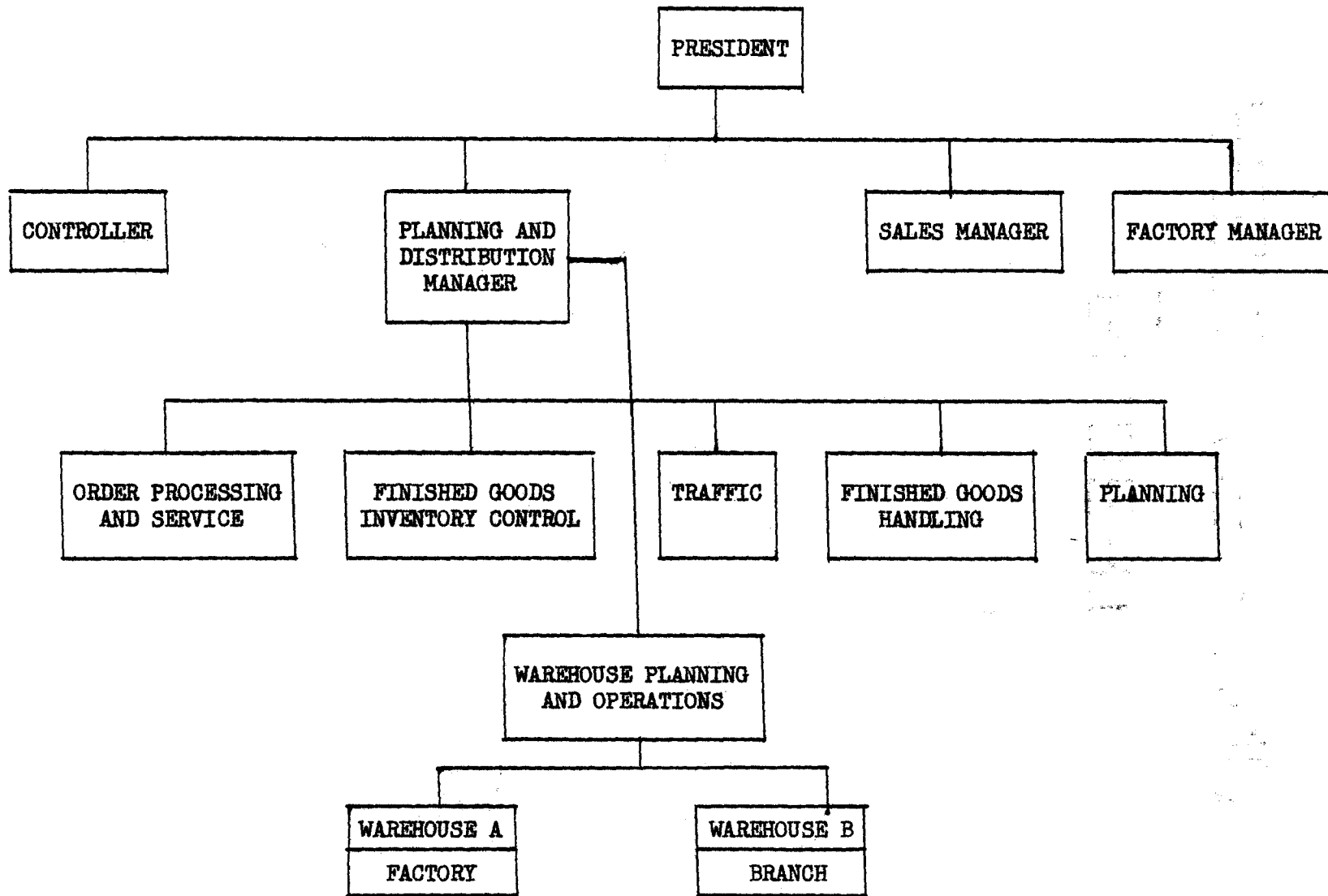


EXHIBIT 2. ORGANIZING FOR PHYSICAL DISTRIBUTION--SMALL FIRM

what the status of an order is--he knows the problems which may have cropped up in the production line (which the salesmen in the field would not normally be aware of), causing delay for the order. The distribution manager is in a position to contact and work with the factory manager, and if the problem is not there, he can easily contact the warehouse supervisor and find out if the order is at Warehouse A or B, or in transit. Furthermore, the distribution manager is in a position to do something about the order if a problem arises. As stated before, he can coordinate on equal terms with the factory manager, and he is in direct supervision of warehouse activities, order processing service, traffic, and all the other distribution functions, as illustrated in Exhibit 2. Under the old system, shown in Exhibit 1, the sales personnel had responsibility for only order status inquiries, and were not in a position to precipitate action for rapidly solving distribution problems which had their roots in production, warehouse activities, traffic, and the like. They had no authority over the distribution system, and neither did anyone else. Under the organizational system in Exhibit 2, sales personnel can funnel all their questions and problems concerning distribution through the distribution manager, who can handle and solve these problems through a workable, organization framework which provides him the necessary authority and responsibility.

#### Organizing for Larger Firms

The situation just discussed was that of a small, relatively uncomplex firm. A more complex plan of organization for a larger company with a number of plants and branch warehouses is shown in Exhibit 3. This plan prevents disunity in the distribution function in three ways:

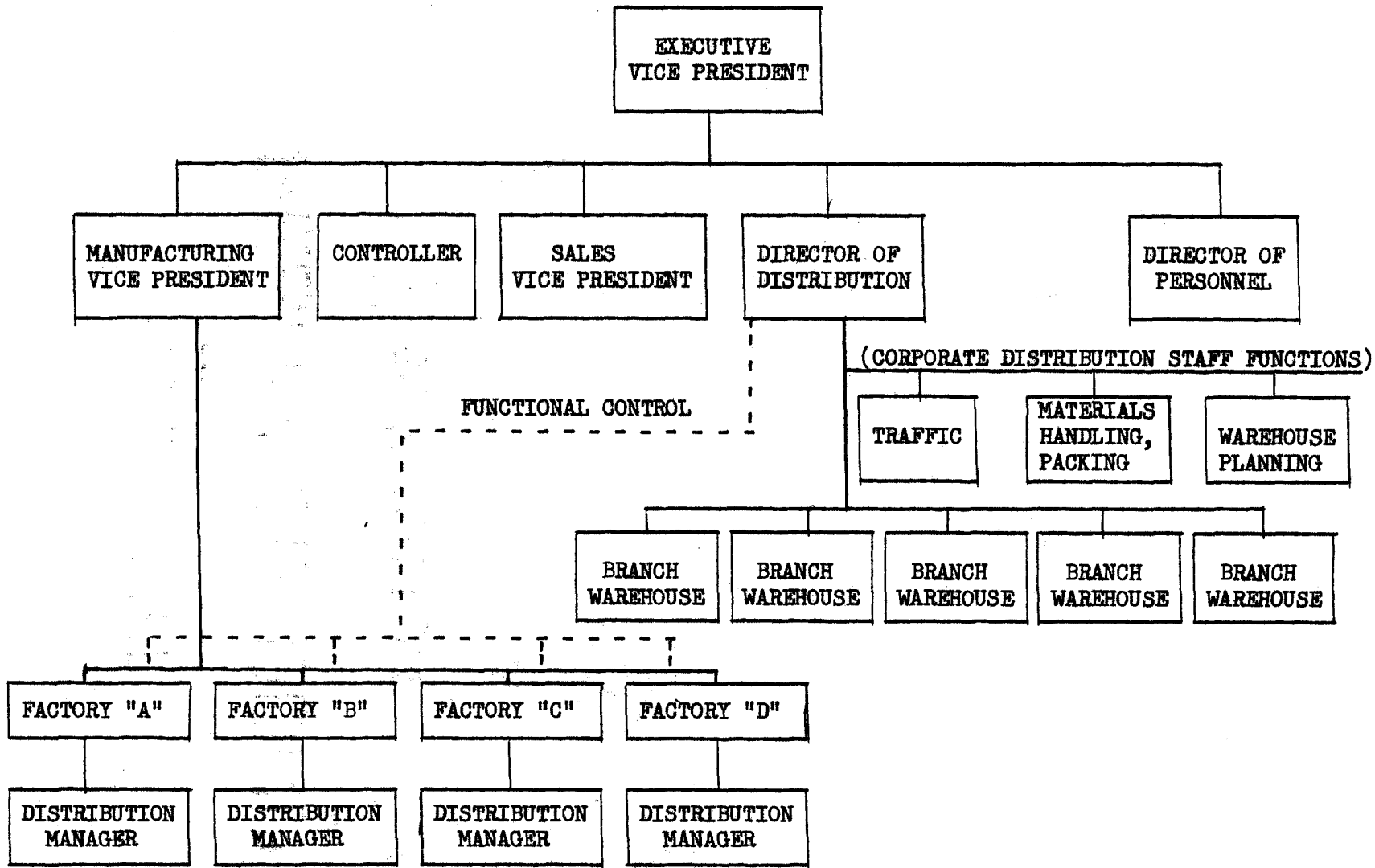


EXHIBIT 3. ORGANIZING FOR PHYSICAL DISTRIBUTION--LARGE FIRM

1. It unifies responsibility at the plant level for administering physical distribution functions. Line control is under the factory manager, with functional direction under the corporate distribution director.

2. It relieves the sales function of the responsibility of operating branch warehouses, thus breaking the traditional pattern of establishing branch warehouses to correspond with the location of branch or regional sales offices.

3. It creates an objective and neutral influence which helps to strike a balance between service needs on one hand, and cost of service on the other.

The last organizational plan (see Exhibit 4) to be presented as a means of initiating action to cope with the total distribution problem will be that of a company composed of several semi-autonomous product divisions. This type of situation would be more complex than either of the two situations presented so far (Exhibits 2 and 3). Let us assume, for this situation, that each factory produces only one product line, but that each of the company's product lines is distributed nationally. If each division were to undertake the distribution of its own products without regard to what the other divisions are doing, the waste would be staggering. A corporate distribution group, cutting across divisional lines, is an absolute necessity where there are possibilities for combined shipping and warehousing. Such a distribution group eliminates the gaps not only between sales and manufacturing, but also between divisions. The major services performed by such a corporate staff should include the functional direction of traffic in each division, the planning and operation of the corporate branch-warehousing system,

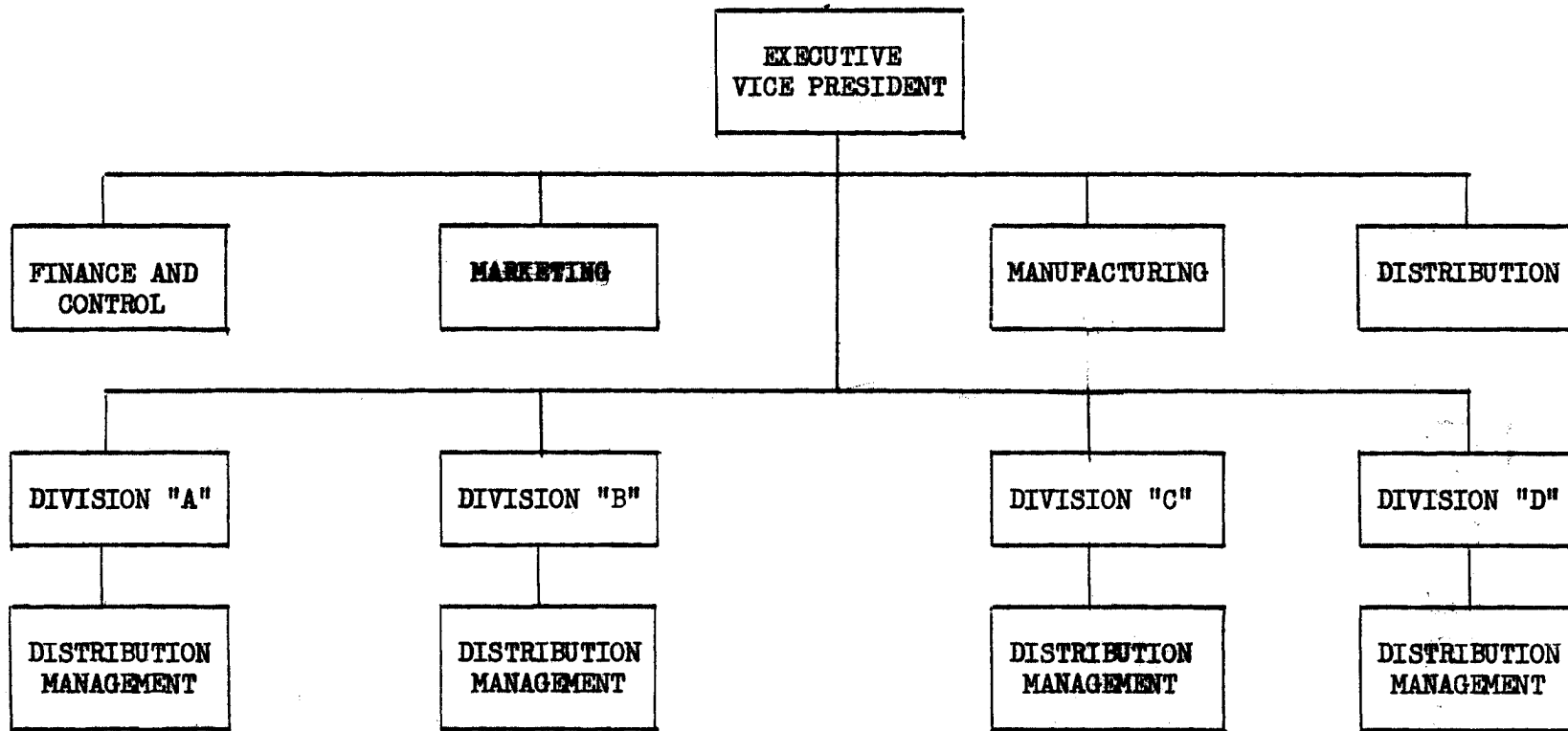


EXHIBIT 4. ORGANIZING FOR PHYSICAL DISTRIBUTION--LARGE FIRM WITH SEMI-AUTONOMOUS DIVISIONS.

and the provision of technical assistance to divisional distribution groups on a wide range of problems.

#### Placement of the Distribution Function

We have considered organizational solutions (through the use of organizational charts) for a small firm, a larger more complex firm, and a large firm comprised of semi-autonomous divisions. In these exhibits, it was assumed that the physical distribution function was reporting to the chief operating executive of the company, either the president, or an executive vice-president. This is, in fact, the practice in many large companies today. Frequently, the traffic function alone is often thought to be important enough to report directly to the top operating executive, and broadening the scope of the traffic function to include all of the other distribution activities would certainly seem to enhance the argument that it should report top-side, to the president or executive vice-president.

In situations where a top-side reporting plan is not feasible, another choice for reporting is to an administrative vice-president, whose activities usually embrace a wide variety of staff functions. The particular virtue of this position is that it is a neutral corner whose occupant can evaluate dispassionately service requirements and opposing cost elements.

The securing of a neutral position for the distribution function is vitally important. When distribution is placed under sales or manufacturing, trouble and complications may result. Assuming that the distribution function is subordinate to sales, some of the things that can happen are:



1. Sales is naturally inclined to provide customer service at any cost, and it may well over-invest in branch warehouse inventories, incur expensive less-than-carload and less-than-truckload shipping costs, etc.

2. The traffic department is called upon to serve other divisions or functions of the business, such as manufacturing and purchasing. Placing traffic under sales may limit its ability to render corporate service.

3. Branch warehouses tend to be located automatically with branch sales offices, even though the organization and location of selling functions in a territory may bear no relationship to the economics of warehouse location.

4. Sales executives are saddled with an operating function for which they have little training and understanding: distribution economics.

If distribution is placed under Manufacturing, many of the same weaknesses occur as under Sales; operations become restricted to the manufacturing point of view, and distribution is treated as a subordinate, secondary function that does not (although it should) merit first-rate, top-drawer attention from manufacturing executives. Thus, there is a strong argument for placing the distribution function in a neutral, equal position with functions such as Sales and Manufacturing, in order that decisions may be made objectively and for the good of the entire firm, rather than favoring any one particular department.

#### Evolution and Growth

In today's business world, reorganization and correct placement of the distribution function are vitally needed in many firms. It may

be possible, but not advisable, for a firm to establish an autonomous distribution department "over night." But because of the complexity of distribution, and the many people usually involved, a rapid change may only result in confusion, ill feelings, and subsequent failure. Rather, firms succeed best in revamping distribution activities by proceeding a step at a time. Some firms advance in planned stages, while others subconsciously transform to a single distribution function. In other words, distribution departments tend to evolve through fairly distinct stages through time.

J. L. Heskett, a frequent contributor to business publications, such as the Journal of Marketing, made a study of the distribution systems of 350 firms by use of mailed questionnaires sent to all firms, and 60 follow-up interviews.<sup>4</sup> His study included many facets of distribution, and one of the more important results of the study was the definition and establishment of some key points in the evolution of a distribution system.

The firms in the study represented such diverse industries as electronics, ladies' ready-to-wear, machine tools, chemicals, dairy food processors, grain millers, steel millers and fabricators, and brewers. Over 90 percent of the firms reported at least \$1 million in sales for the calendar year 1958, and were selected by Standard Industrial Classification listings. Cooperation by mail was received from about 57 percent of the firms studied. Follow-up interviews were conducted in order to verify results obtained by mail, and to obtain more complete information.

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<sup>4</sup>J. L. Heskett, "Ferment in Marketing's Oldest Area," The Journal of Marketing, 26:40-45, October, 1962.

The results of the study indicated that: (1) a prospective physical distribution division or department passes through four phases of development which may be called shipping, traffic, movement, and physical distribution; (2) the over-all organizational trend is toward the consolidation of responsibility for physical distribution in one department; (3) there is a significant lack of physical distribution cost information in the firms studied.

Phase of development of departments in each firm were measured quantitatively in terms of specific activities unified under one functional executive. They were also described qualitatively, based on pretest and follow-up interviews in the firms studied. The first phase, shipping, is that in which the activities of physical distribution are fragmented. In this situation, the responsibility is divided among many functional areas, no one of which is interested in the seeming common and uninteresting affairs of shipping operations. Generally, persons with little or no formal training, or hope of advancement, are placed in supervision of these operations. Frequently, in this phase, the shipping department is found to be little more than an extension of the manufacturing line, with the shipping manager reporting to a manufacturing executive at each plant.

The next phase, traffic, is that which is typical for firms which have advanced beyond their initial phase of growth. Here we have a situation in which the firm is becoming somewhat aware of the need for some coordination of physical distribution, and have thereby appointed a managerial specialist in the field of transportation. The scope of responsibility for the traffic department rarely exceeds that of hiring transportation services or supervising privately-owned transportation

equipment. Although this traffic phase is an improvement over the shipping phase, control is still noticeably lacking, and consequently many traffic executives supervising departments of this type have little interest in other phases of the firm's operations. In fact, the study indicated that they may even build barriers to cross-communication of information within their firms by creating and using a technical language foreign to all but the traffic manager. In these firms, the ultimate responsibility for all physical distribution activities will be found to rest only with the president, because of divisions of authority among the traffic, manufacturing, marketing, finance, and procurement functions.

The third phase of development is that of movement. This typically encompasses not only transportation and materials handling activities, but also those concerned with some or all of the firm's warehousing. By now the firm is well aware of the opportunities and advantages of an over-all physical distribution department. The author of this study, J. L. Heskett, states that, "It is at this phase of development that possibilities first occur for effective management of movement systems of distribution."<sup>5</sup> Here, for the first time, the movement manager has a scope of authority sufficiently wide to deal with several of the basic factors affecting distribution costs. We no longer have a distinterested, unauthoritative group of people, each concerned with only a small section of the whole distribution system. Instead, the movement manager is in a position to begin utilizing techniques of physical distribution analysis in at least planning and supervising systems of movement control.

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<sup>5</sup>Ibid., p. 43.

The final phase is one in which a unit or division is collectively responsible not only for movement control, but also for full demand-supply coordination. This would comprise a bona fide distribution department. Of course, it is realized that this pattern on evolution would not serve to describe the development of physical distribution systems in all organizations, but it is thought to be fairly representative of the typical distribution development.

## CHAPTER III

### CASE STUDY AND APPRAISAL

#### Case Study--the Pillsbury Company

A case study of an actual firm will serve to illustrate the creation of an effective distribution department. For this purpose, the Grocery Products Division of the Pillsbury Company provides an excellent example of a firm which was definitely deficient in the distribution function, but which reorganized to solve the distribution problem.

The Pillsbury Company is representative of many firms in the country today, which have grown from a small, family-owned business, to large proportions in a relatively short time. Since 1869, when Charles A. Pillsbury and his uncle, John S. Pillsbury, began milling flour in Minnesota, the firm has expanded and today employs about 7200 people. In the mid-fifties, the company faced staggering distribution problems. The firm distributed their well-known Pillsbury's Best Flour, cake mixes, frosting mix, dessert mixes, instant potatoes, and roughly 160 other baking items. These goods were sold to 4,000 direct accounts, while contacts were maintained with about 65,000 retail stores supplied by wholesalers. The sales force at that time worked out of 33 branch offices. At each location, personnel performed accounting, credit, and order-processing functions, and also provided the sales manager with inside sales services and statistics. Warehouse stocks controlled by these branches were carried at about a hundred locations, primarily to supply smaller direct accounts and to make fill-in shipments to car-lot

buyers. Turnover was slow, warehousing costs were high, and there was no effective centralized control over inventories. At that time Pillsbury was operating out of nine plants--four flour mills, two mix plants, and three plants making both flour and mixes. It had been considered efficient to ship customer orders from plants because the products could then be stream-loaded--that is, they could be moved by conveyor or chute directly from packing line to boxcar. This practice, however, became extremely complex as new products were added to the line. As more products were added, the firm gradually drifted into extensive warehousing. Manufacturing and warehousing proved to be a bad combination in that the manufacturing function too often neglected the important distribution activity, warehousing. For example, at one location, over a period of time, ingredients, packaging materials, and finished goods became stored in nine warehouses away from the main plant. It was difficult to locate raw materials, stock rotation was a problem, and there was considerable duplication of effort. Also, plant down time had a direct effect on warehouse productivity. It was also difficult to establish work standards and maintain good cost accounting practices.

It became obvious to the top management of Pillsbury that production and marketing had naturally grown to meet customer demands, but that physical distribution had been forced to "fit in" as best it could. The problems at Pillsbury could be summarized as follows:

1. They were losing consumer sales as a result of out-of-stock conditions at the wholesale and retail levels.
2. Distributors were dissatisfied.
3. Costs were high at plants and warehouses.
4. They were making fill-in shipments at high less-than-truck load lots.

5. Branch operations were costly, largely because of the manual processing of orders.

6. Inventory control was especially poor.

7. The entire distribution function was constantly in a state of general confusion, with no responsible, authoritative person in charge.

These problems had to be solved by Pillsbury, and in order to begin, top management first took the necessary steps to solve the biggest single problem--the fact that the distribution function was dispersed and fragmented as explained and illustrated in earlier sections of this paper. Pillsbury's management realized they must reorganize the distribution activities under one distribution department and one distribution manager.

To do this, a Grocery Products Distribution Manager position was created, as shown in Exhibit 5. The head of this department sits among the marketing, sales, procurement, and production functions, attached to no one, and independently accountable for his actions. He participates in market planning, generally from the time a sales idea is accepted. He then becomes the bridge to production in reaching agreement on plant schedules. He also translates product requirements into ingredient and raw material needs, and becomes the liaison with the procurement function as it develops forward buying programs. To sum up, it is the Grocery Product Distribution Manager's responsibility to determine the amount of product needed to meet the sales forecast; to decide when and where this product should be produced; to pick it up, in effect, at the end of the production line; to decide where it should be positioned; and to select the mode of transportation required. The



GROCERY PRODUCTS  
DISTRIBUTION MANAGER

Responsible for:

1. Distribution of all Grocery Products Division products
2. Grocery Products distribution cost control
3. Grocery Products customer service
4. Liaison between Sales and Manufacturing

CREDIT MANAGER

Responsible for:

1. Credit approvals
2. Collections
3. Accounts Receivable records
4. Signed-contract follow-up
5. Customer claims
6. Name and address files

SUPPLY MANAGER

Responsible for:

1. Customer service
2. Scheduling of shipments
3. Order processing
4. Invoice processing
5. Warehouse inventory control
6. Grocery Products distribution control

ACCOUNTING AND CONTROL MANAGER

Responsible for:

1. Accounts payable such as expense accounts, promotional payments, damaged goods, etc.
2. Stock and premium accounting
3. Claims (stock)
4. Office services, such as telephone, teletype, mail

TRAFFIC MANAGER

Responsible for:

1. Routing, including cost control
2. Expediting shipments, both truck and rails
3. Tracing
4. Transit applications
5. Freight-bill auditing

DATA PROCESSING MANAGER

Responsible for:

1. Operation of data processing equipment and operating personnel
2. Scheduling of work to insure prompt and accurate reports and maintain good utilization of machines
3. Creation and revision of procedures for service center operations

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EXHIBIT 5. CREATION OF THE GROCERY PRODUCT DISTRIBUTION MANAGER'S POSITION,  
THE PILLSBURY COMPANY

Source: W. H. Gribble, "Physical Distribution Management in Pillsbury's Grocery Products Division," American Management Association Management Report (Manufacturing Division), Report No. 49, 1960, p. 158.

managers at Pillsbury say they like this kind of distribution system because it provides no place for alibis. Although it is true that the Grocery Products Distribution Manager is dependent on marketing forecasts, his accountability is pure and simple; he must have the product available at a specific location at any time a customer's order materializes, maintain minimum inventories, and avoid peaks and valleys in plant production schedules.

The Pillsbury Company was selected for this case study of revamping a distribution system because they have so completely reorganized distribution activities. From a state of confusion, this firm created a valuable distribution department. The distribution manager actually determines where the products should be made! The management realizes that the distribution manager, more than anyone else, can best determine manufacturing locations, among many other things. After the reorganization of the distribution function, during 1955 and 1956, sales increased about 9 percent during the next three years (see Table V).

TABLE V  
THREE-YEAR EARNINGS RECORD  
(000 omitted)

	1959	1958	1957
Net Sales	\$359,658	\$350,610	\$331,363
Earnings before Income Taxes	17,733	12,962	8,203
Earnings after Income Taxes	7,913	5,642	4,007

Source: The Annual Financial Report (years 1957, 1958, 1959) of the Pillsbury Company, Minneapolis, Minnesota

Notice, however, that the increase in earnings before taxes was more than 100 percent. This tremendous increase is felt by the top management of Pillsbury to be largely attributable to the cost-savings realized by the reorganization of the physical distribution function.

It should be pointed out that Pillsbury's successful reorganization of their distribution system did not take place "over night." Rather, it evolved, as explained in the last section of Chapter II, over about a two-year period beginning in 1955. Many were the trials and tribulations, the adjustments for personnel, appraisals, and revisions, which finally resulted in a smooth-working distribution system which enabled Pillsbury to effectively reduce this huge cost-saving area, physical distribution.

#### Outline for Appraising and Reviewing Physical Distribution Systems

Assuming that a firm accomplishes the important first step of organizing to meet the problem, as Pillsbury did, what next should the distribution manager do in order to successfully cope with the many other distribution problems? Of course, there are many different actions and directions which may be taken, many of which are equally good or bad, but experience indicates that there is no substitute for a complete, balanced review of the entire distribution activity. Anything less than this will produce only limited cost reduction. For example (this ties in with the discussion of suboptimization in Chapter II, p. 17), it makes little sense to concentrate on improving the efficiency of a warehouse when economic or service justification for the warehouse itself is lacking. A review and appraisal of an entire distribution system takes a huge amount of time, but it provides a background of basic

understanding that cannot be obtained any other way. Through the review and appraisal of the distribution system, the newly appointed distribution manager is bound to find that some things (it may be the packing process, or the type of transportation being utilized, etc.) may be left just as they are, while others may be drastically altered or even completely eliminated.

It should be pointed out that this descriptive outline for appraising a distribution system should also be used after a deficient system has been corrected and improved. Periodic review is definitely one of the key points in maintaining and improving the distribution function. Again, no one element of the total distribution picture is dealt with in an exhaustive, detailed manner--to do so would not be possible in this paper. Instead, the proper perspective for appraising an entire distribution system is first developed. Then, the outline leads the appraiser to determine the key elements in five important distribution activities, which are: (1) Transportation; (2) Warehousing, Receiving, and Shipping; (3) Inventory; (4) Order Processing and Related Data Processing Activities; (5) Packaging.

Developing Proper Perspective. Developing the proper perspective is the first step in appraising and improving a physical distribution system, assuming that a separate distribution department and manager have been created and appointed, and have the full backing and approval of top management. To develop the proper perspective, the distribution manager must consider the following:\*

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\*Note: This outline, starting on p. 38 and continuing to p. 40, is based mainly on an article by Wendell M. Stewart, entitled, "Physical

1. Analyze present distribution patterns and demand requirements, by quantifying customer ordering habits, such as the frequency and size of order, number of line items per order, the relative volume of demand by item.
2. Review the nature of demand, that is, the degree and duration of sales fluctuations, volume growth trends, and product mix trends.
3. Analyze the geographic concentration of sales and study the present concentration versus anticipated future concentrations.
4. Review and analyze competitive distribution programs. Interviews with sales personnel, wholesalers, retailers, and jobbers will be the main source here. Ask what the consumer likes about the distribution systems being used by other firms --ask what they dislike.
5. Determine the company's present customer service levels by product group, geographic area, class of trade or channel of distribution. Are customers satisfied in one area, but not in another? If so, why?

Transportation. After the distribution manager has achieved the right perspective, or is oriented toward the total distribution function, he should next turn to more specific areas, beginning with transportation. The distribution manager, in order to understand just what is involved in the transportation area, should begin by determining the following:

1. What are the operating costs by mode, product group, and geographic location?
2. What are the tonnage volumes by mode, product group, and geographic location?
3. What is the relative usage of the various modes of transportation--rail versus truck versus forwarder, and the economic or service justification of each?
4. What is the relative expense of owning or leasing a private fleet?

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Distribution; Key to Improved Volume and Profits," which appeared in The Journal of Marketing, 29:65-70, January, 1965. Additions and deletions have been made by this writer.

5. What is the cost of the company's f.o.b. policy?

Warehousing, Receiving, and Shipping. Concerning Warehousing, Receiving, and Shipping, the distribution manager should determine the following:

1. What are the operating cost, both in-plant and in the field, for all private and public warehousing done by the company?
2. What are the facility and equipment costs? Should they be owned or leased?
3. What are the manning requirements at each location?
4. What are the methods and procedures for handling goods? What are the possibilities for increased automation, mechanical handling?
5. What is the clerical work volume, cost, and productivity?

Inventory. The distribution manager naturally has to cope with inventory problems. He has to be familiar and knowledgeable as to the different ways in which the inventory is accounted for (LIFO, FIFO, etc.) and, in addition, he must know the following:

1. What are the average month-end unit levels?
2. What are the turnover rates by location?
3. What is the average inventory value?
4. What are the carrying costs, totally, and by location?

Order Processing and Related Data Processing. With respect to order processing and related data processing techniques, the distribution manager should determine the following:

1. What are the present costs associated with order processing?
2. What is the capacity of the present system?
3. What is the need for compatibility with other company data processing procedures?

Packaging. Lastly, with respect to packaging, the distribution manager should know:

1. What are filling and container costs?
2. What are repackaging costs?
3. What are the pertinent ICG packing requirements?
4. What are the possibilities of standardization of packages?

It is obvious that the mere compiling of all this information is, as before mentioned, a big job, but a necessary one. Naturally not all of the information can be exactly determined, and gaps in the data are bound to occur. Offsetting this will be new insights and new information of which management was not aware of, but which can be used in revamping the system.

One might very well ask what is to be done with all this information. By knowing present costs and customer distribution requirements, it is possible to begin developing a representative range of alternative distribution methods and plans. A distribution manager could start by attempting to simplify the system. Since it cost money to handle the product, which handlings--if any--can be eliminated? Is more direct shipment to customers possible? Can the present channels of distribution be simplified? What would happen if the present order cycle were shortened? Is it necessary to make all warehouses full line? Is it economically feasible to consign stocks to customers and let them handle the warehousing? Can the use of premium transportation enable more-than-offsetting cost reductions in field warehousing and inventories? Are fluctuations in demand gradual enough and sufficiently predictable to enable further centralization of inventory? Is the present distribution

system keyed to handling the troublesome exceptions, or the easy-to-handle, run-of-the-mill type orders?

The distribution manager could then look at possibilities for utilizing recent technological innovations. Can standard containers or specially designed bulk packs be used to unitize loads and thereby reduce piece handling? Can the product be stored and transported in such a way that it can be unloaded directly into the customer's processing operations--thus reducing packaging, handling, and delivery costs?

These are some of the many questions which can be asked about almost any distribution system. If these questions are answered correctly, through a complete survey, it is felt that plans for improvement of the system are bound to shape up into a number of workable alternatives, which will depend upon the nature of the firm being surveyed.



## CHAPTER IV

### SUPPORT AND CONCLUSION

#### Widespread Support

Perhaps the organization most avidly in support of the concept of reorganizing and unifying distribution systems is the National Council of Physical Distribution Management (NCPDM), which has been mentioned from time to time.

The NCPDM was founded in 1963 for business executives with a professional interest in the field of physical distribution. It includes members from industrial concerns as well as consultants and educators. It is reported to draw heavily from the areas of operations research, military logistics, and the field of complex decision making with the aid of business mathematics and computers. Those interested in the activities of this association may write to James J. Hardcastle, Secretary, National Council of Physical Distribution Management, Gillette Safety Razor Company, Gillette Park, Boston, Massachusetts, 02106.

#### Support from Industry

Probably one of the best indicators of genuine interest in centralization and consolidation of physical distribution is the attitude toward the concept by industry. For example, A. B. Knight, president of the Norge Division of Borg Warner Corporation, has stated:

Establishment of this new management position represents a significant realignment of operating responsibilities. Recognition of physical distribution as a broad management function is vital if the full potential of related technological advances

is to be realized. This move to focus increased management attention on physical distribution and integration of related operations will result in the improved product availability, greater distribution flexibility, and better investment utilization that's vitally needed. . . .<sup>1</sup>

For an organization like the Norge Division, in the highly competitive consumer products field, a key consideration was to improve dealer service. U. S. retailers can choose among many kitchen appliance makers, so the manufacturer that provides the retailer with the greatest profit margins will have his appliances displayed and pushed. Norge found that the somewhat paradoxical way to greater profits was to increase its own warehousing cost. This led to more-than-offsetting increases in sales, as well as to lower dealer inventories.

Chicago's Mercury Record Corporation has embraced a single distribution system whole-heartedly. A company spokesman reported Mercury cut warehousing, inventory, and obsolescence costs by 40 percent as a result of a shipping survey conducted by their distribution department.

Another proof of industry's enthusiasm is demonstrated by the Hammond Valve Corporation. Hammond, a company which makes bronze valves, took a route similar to Norge. They used to distribute their line through jobbers, but discovered, as a result of a distribution department realignment, that they could boost profits by improving service to ultimate consumers. Hammond opened six regional warehouses, and now it takes two days to service a customer's order instead of six weeks, as before. The president of Hammond, Morris R. Beschloss, says that largely as a result of the new distribution system, sales have more than doubled in the last five years. Greatly increased volume and

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<sup>1</sup>Jay H. Bullen, "New Competitive Selling Weapon; Physical Distribution Management," Sales Management, 94:42, May 7, 1965.

lower unit production costs have far outweighed the added costs of operating warehouses. Other firms having, or converting to formal distribution departments are General Electric, American Cynamid, A. E. Staley Co., H. J. Heinz, Lever Brothers, Scott Paper, Xerox Corporation, Du Pont, and Johnson and Johnson.

#### Government Interest

Not only are educators and industry endorsing the concept of consolidating distribution functions--the Federal Government is becoming increasingly interested in the distribution problems of the nation, particularly in the area of transportation. President Johnson, in his State of the Union Message on January 12, 1966, stated, "A new Department of Transportation is needed to bring together our transportation activities. The present structure--35 Government agencies, spending \$5 billion yearly, makes it almost impossible to serve either the growing demands of this great nation, or the needs of industry, or the right of the taxpayer to full efficiency and real frugality."

The new Department of Transportation is an amalgamation of 30 existing federal commissions and boards, plus four new units created by the 89th Congress. It will start out with 100,000 employees, and budget exceeding \$6 billion. It will be the fifth largest of the 12 cabinet departments. The job for the new department is a big one. It will be concerned with the coordinated interaction of 90 million vehicles, 3 million miles of paved roads, 100,000 private and commercial aircraft, 21,000 barges and towboats, and 25,000 miles of improved inland waterways. Also included are the 2½ million Americans who earn their living by moving people and goods, accounting for about \$120 billion in our economy each year.

Of special interest to educators is the experimentation being conducted jointly by universities with the Government. The Government (through the Department of Commerce) has set up a model transportation complex on the computers at the University of Pittsburgh. Experts working on the project want answers on how to mesh the services of rail, truck, and ship lines, to remove regulatory barriers, and the like. The University has been awarded \$125,000 to find ways of improving inter-modal coordination of freight movements.

The most promising Federal contribution to private industry's struggle to better understand and upgrade distribution functions is the prospect that the Government may bring out a Census of Distribution to complement its much used Census of Manufacturers. The new series, which might give valuable distribution information such as transportation costs, advertising costs, and direct selling costs per dollar of shipment value, is not expected to be offered for some years. But top Commerce Department officials make it clear that such a comprehensive service is their goal in the present campaign to forge stronger links with marketers.

Commerce Secretary John Connor invited 60 marketing people from corporations and universities to Washington recently for round-table discussions of just how his department--long oriented toward the production side of business--could get more deeply involved in the distribution end. Commerce officials think that marketing efficiencies have not kept pace with production efficiencies, that dollar savings from innovations in the years ahead will be most noticeable in the half of product cost that is laid to distribution.

It is likely that Commerce will reorganize its Business and Defense Services Administration--generally business' prime point of contact with the Federal Government--to put more emphasis on business functions (such as physical distribution), rather than on end products. However, BSDA's heavy work load of production problems related to the Viet Nam war means that such sweeping changes will have to wait.

Meanwhile, Commerce wants to "continue its dialogue" with the marketing men. In the recent round-table talks, there were few specific suggestions of approaches the department might take, but further conferences are likely, and they should close in on individual marketing problems.

#### Concluding Remarks

The main problem in physical distribution today is that of fragmentation and dispersion of the distribution function. Almost without exception, in the twentieth century business world, the functions of marketing and manufacturing have received the most attention by top management. It has seemed natural to first be concerned with the question, "Can we make a satisfactory product at a satisfactory cost?" and then, "Can we sell the product to the public at a satisfactory price?" If these conditions could be met, it seldom occurred to management to be overly concerned with the question, "Can we get the product there without breaking or spoiling it in the least amount of time?"

New manufacturing processes, new sales techniques have evolved, but equal progress in distribution has not been achieved. Distribution has too long been neglected and taken for granted. Today management is

realizing the fact that distribution comprises the third largest cost of doing business and cannot be "taken for granted." The reorganization, unifying, and consolidation of the distribution function is coming to the fore. The concept of a separate distribution department is being embraced by authors, industry, and the Federal Government.

The fact that professors, businessmen, and governmental agencies are concerned and are focusing their attention on distribution as a whole, on this "No Man's Land" in our economy, practically insures that physical distribution in the future will be transformed from a chronic trouble spot to an efficient, smoothly functioning tool for management and the nation. By looking around us, we can see evidence of the changes taking place. Computers are solving inventory problems, whole trucks are being fork-lifted on to flat-cars, order-processing times are being slashed, and goods are being packed and containerized for protection, ease-of-handling, and convenience as never before. That Dark Continent, physical distribution, will, in time, become a settled, productive region in today's business world.

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