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General Editor: PROFESSOR J. H. JONES, M.A.

FACTORY
ORGANIZATION

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FACTORY ORGANIZATION

BY

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WITH A FOREWORD

BY

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FOREWORD

ECONOMICS is rapidly coming into its own. The value of economic study is already admitted by those who accept the obligations of leadership in social and political affairs. It is also recognized by those who determine the training of candidates for the business professions. People employed in industry and commerce, however, are less ready to admit its value in their own callings. They once regarded economics as the handmaid of politics (in its wider sense) rather than the servant of private business. Their attitude has changed to the extent that they now see the necessity for departments of economic intelligence within their associations; a small number of progressive firms have even made room for such departments in their own establishments. But business men have yet to be convinced of the value of economic study as part of the training of a business man.

Nor is their indifference to economics surprising. The number of professional economists in this country has always been so small that the field covered by the science could not be fully explored and cultivated, and until recently the analysis of those problems which fall under the title "business economics" has been largely neglected. Until the analysis of general economic conditions is supplemented by fuller analysis of special industries and types of business enterprise such indifference will continue.

It is the purpose of this series of studies to apply economic principles and the methods of economic analysis to special fields of activity. It is proposed not only to provide a more elaborate treatment of problems, such as labour, marketing, and credit, which are already discussed in books on general economics, but also to publish studies of special industrial and commercial problems which have hitherto been neglected.

It is appropriate that the first volume issued to the public should be concerned with the organization of a factory. The authors occupy responsible positions in one of the largest and best organized industrial establishments in Great Britain. The firm which employs their services has revealed qualities of industrial leadership of the highest order. The authors are in a position to see the full range of the firm's activities; their experience and success as business men, combined with their knowledge of American methods and their own earlier training in economics, fit them to be the authors of the first book of its kind published in Great Britain.

J. H. JONES.

UNIVERSITY OF LEEDS.
October, 1927.

PREFACE

THE application of systematic, scientific methods to the conduct of business is one of the most striking developments of the present day. Business is tending to become an exercise in constructive thought. "Rule of thumb," even when it is called "experience," is an inadequate guide to efficiency in an age when British trade is facing unprecedented difficulties, and when, in this and other countries, radical changes are taking place in the very structure of modern industry. The world-wide movement which is known as "rationalization" is evidence that business men themselves are feeling the need for more disciplined thinking and more system and coherence in the management of their affairs. No large-scale institution runs without plans and arrangements, and the complex organization of a modern business establishment is no exception.

The first step towards a more scientific business attitude is to formulate general principles of organization. These are fundamental, in that they prescribe the structure within which general development takes place, and set limits to what is humanly possible under given conditions. Of almost equal significance are the ends or purposes to be attained in each particular set of circumstances—the policies which a business lays down. These react upon the whole range of activities which thus become plans for the attainment of ends. Scientific method operates through various channels. It is implied in the rigorous analysis through which alone general principles of organization can be discovered or business purposes be made clear to those charged with their execution. It will be manifest in the comparison, investigation and selection of the plans and measures used to carry out business purposes. Finally, it will be used in the co-ordination of the considerable range of knowledge which must be brought into play and of the

complex of activities, all of which should unite towards the same end.

At the same time, business has become an essay in applied economics. It is the sphere from which the subject-matter of economics is drawn, and in which the principles of economics, its theories and postulates, can be tested and applied. The application of economics to business is only another instance of the tendency to use scientific results. Clear thought upon such matters as wages, costs, prices, and price-fixing is facilitated by a knowledge of economics, while the collection, analysis and study of broad economic facts are tending to illumine much of the problem of salesmanship. The factory and the warehouse are being linked with the classroom of the economist, and the student himself is tending to find in business an outlet for his practical activities.

This book is an attempt to meet the needs both of the practical business man and of the student of economics. Its purpose is to present a general survey of the more important aspects and the more advanced practices of modern factory management. It is written by a group of men trained in a variety of university schools who have taken up work in the same factory, and are engaged in the management of some of its principal functions. They have approached the subject-matter as scientifically and objectively as it was in their power to do. They have sought to describe the elements and principles of factory organization systematically and logically, but have always kept in mind the need for explaining the necessity or desirability of any arrangements they describe. They hold that organization must be considered both in the light of its general principles and of its end or conclusion. If they have succeeded in making principles and conclusions clear, they will have fulfilled their scientific purpose.

The book has been edited by one hand, but mainly to guard against repetition and overlapping, and to keep a balance and proportion between the various aspects of the

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• subject. Differences of personality and style are preserved, and the book, therefore, goes forth undisguisedly as a joint product. The contributions of the several authors are indicated by placing their names at the head of the chapters which they have written.

YORK,

October, 1927.

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FACTORY ORGANIZATION

CHAPTER I

INTRODUCTION

BY CLARENCE H. NORTHCOTT

THE LAYOUT OF A FACTORY

THE problems of factory organization arise from the purposes which a factory serves. These purposes are not easily stated in a single sentence, but they are substantially the production of goods which supply an effective demand. Essentially, a factory is a place where men and plant } equipment are organized to convert raw or semi-manu- } factured materials into useful and serviceable products, and to place them upon the market at a price which permits of their sale and furnishes an adequate return to all factors, personal and impersonal, engaged in their production and distribution. It is irrelevant to bring in profits as the ultimate aim, a mistake made in some economic theories and in much socialistic criticism. Profits are a measure of success, by reason of the fact that a margin over and above cost is essential to the continuance of the organization. It is almost more true to say that the purpose of a factory is production ; that it exists to supply the world with goods } and services ; and that the psychological motive which prompts its controllers is their need to find expression for their power and capacity.

The primary problem of factory management is that of location. This is a matter requiring much thought and deliberation, which is not lessened even when the factory in question is an established one. Dynamic changes, often quite intangible and unpredictable, alter the convenience of a particular locality. The development of coal mines in

localities like South Yorkshire and Kent, and the exhaustion of mines elsewhere, will rob an establishment in one of these latter areas of its former superiority. The migration of trades is an established fact of industrial history. The woollen trade of the West of England has shifted to the Yorkshire valleys. By reason of their nearness to coal and iron producing areas, the Clyde, the Tyne, and the Wear have captured the shipbuilding of the Thames and the Bristol Channel.

The chief and primary measure of the suitability of a site is economy of working. The overhead costs of an establishment are those of the plant and its equipment. In most cases, they form a considerable proportion of total costs. Consequently, every factor which enters into the desirability or otherwise of the location of a site will reflect itself in the total cost, and, ultimately, in the success of the business. Further, it will be manifest daily in the working of the establishment, facilitating or hindering such important activities as transport, both internal and external; it will be seen in the cost of raw materials and in that of ancillary operations which are not provided in the factory itself. The fact that all these costs will continue while a factory remains in an undesirable or unsuitable site, only adds weight to the necessity for regarding location from the standpoint of economy of operation.

Economy of operation is affected by six major factors—the supply of raw materials, the proximity of markets, the nature and cheapness of transportation, the supply of fuel or power, the presence of an adequate supply of efficient labour and the proximity of plants which supply machinery, parts, or tools. It is impossible to arrange these in any order of priority, since their relative importance depends upon the nature of the industry and the character of the product. Obviously, one of these factors might transcend all the others, so as to relegate them to a secondary position. For certain products, an adequate supply of labour is fundamental, especially where that labour is highly skilled,

and where labour costs form a large proportion of the total cost. In industries where raw materials are bulky, and their transportation relatively costly, it is in general desirable to locate a manufacturing establishment, such as a steel works, close to the source of supply. If, however, the raw material can be carried cheaply, it may prove advisable to place the mills near the market. Nearness to materials has an important effect also upon the capital cost of maintaining reserve supplies and upon the smoothness and regularity of the flow of production, especially where any of the materials are of a perishable nature. Nearness to markets is in some instances quite as important as nearness to supplies of raw material, especially where the retailer expects regular and prompt deliveries, or where the transportation of the product is costly. The importance of a cheap and easy supply of fuel and power is seen in the way in which factories are found clustered near coal-fields, or round sources of electric power such as the Niagara Falls in America.

The importance of these and other secondary factors can be seen if we examine one of the problems which may confront an individual aiming to begin a business. To-day, business is concentrated in towns, where space is restricted and dear, and where the available factories are badly laid out and often too expensive to alter and impossible to extend. Progressive business men are ready to consider the building of factories in "the country," or it may be, in "garden villages," which, incidentally, have also to be built in "the country." A man thinking of building, let us say, a new automobile factory in such a location, will be required to weigh up a variety of factors. He will need to consider transport facilities, both for his raw and semi-manufactured materials, and for the distribution of his finished products. He will find it an advantage to be near important railway lines and the main arterial roads of the country. It will be an additional advantage if he can make use of one of the canal systems which can still be operated. Since his raw materials are chiefly of small

bulk, and are, therefore, not relatively costly to transport, he is not obliged to place his establishment near one of the great manufacturing areas. But, unless he proposes to build up a vast, self-contained establishment, he must be placed where his semi-manufactured materials and the numberless parts required in the construction of a motor-car can be obtained cheaply and in regular supply. If he desires to use other power than steam, he must be able to obtain it cheaply, and can probably do so by an arrangement with a gas or electricity concern in a town, his demands for power constituting so desirable an addition to overhead costs as to enable him to secure a low quotation. Further, so far as he needs a labour force consisting of skilled craftsmen, he will find it an advantage to be near a large town. Since, however, the sub-division of labour and the many mechanical processes involved in automobile manufacturing have reduced the need for a large proportion of highly-trained craftsmen, it would be possible for him to go outside an urban area, provided that he could obtain a sufficient supply of the labour he needs, and, as suggested above, could secure adequate transport cheaply enough.

But workers in country centres or in small towns and villages have less of what one might call an industrial sense. In some respects, this is an undoubted advantage. They are less obsessed by socially-inherited prejudices and more inclined to give full effort and full co-operation. The wages offered will be much beyond what they have previously earned, and thus act as an additional incentive to effort and output. On the other hand, it may not be possible to find on the spot an adequate supply of people with wit enough to learn the processes of production or to obtain from them enough supervisors and minor executives. This will entail the training of the labour available and the introduction into the locality of persons of a higher intellectual and industrial type. Under the circumstances, a housing programme, involving a considerable capital outlay, may become a business necessity.

• On the question of lay-out, little but general principles can be laid down. The governing principle, as in the question of location, is economy of operation, promoted by easy and convenient arrangements. The size and disposition of the building and its suitability for the product and for the output demanded or aimed at, will govern such other matters as the flow of production and the economy of internal transport. There is a growing tendency to choose sites for new buildings which permit of the factory being of one, or at most two, stories, so designed as to permit of the shortest and most economical routing of goods from their entry as raw material until they pass out as completed products. Moreover, much more attention is now being given to mechanical transport by means of conveyors, to facilitate the flow of production and to reduce the amount of labour effort expended.

The main problem, however, in business, is that of organization. Certain disadvantages of location and lay-out have to be faced in the great majority of industrial establishments in this country. Only the newest factories embody the latest and most economical devices. Most factories are at least 20 years old, and find themselves handicapped as against the more modern plants, even by so short an existence. These handicaps have to be overcome by organization and administration. Arrangements have to be made which will secure the allocation of responsibility and its direction towards the purposes of the business. The "team" necessary for the control of the business must be selected, and taught to work together for a common end. The manual workers must also be selected, allocated to their jobs, and motivated through adequate wages and proper consideration for their welfare. Materials and processes must be so directed as to realize economical and efficient production. Thought must be given to the preparation of the product for the market, and effort and energy expended upon the sale of the product. All this diverse activity must be co-ordinated in one general scheme

which constitutes the principles of management or the policies which govern the business.

It is to the problem of organization that the rest of this book is devoted. Attention is first given to the principles of organization. These principles are of general application. They are of significance alike to a small and a large factory, furnishing guidance for development as well as for efficient current practice. The organization of a business is intended to ensure that work is executed smoothly and economically, in accordance with plans and policies set out by those who exercise supreme control of the undertaking. For this end to be realized, the tasks of the administrator and of the executive officials in charge of management activities must be distinguished and differentiated and steps taken for the exercise of control over results. The principles which govern the general arrangements of the business are fundamental.

The scope of business and the details of its organization are indicated by the subjects of the several chapters which follow. The organization of production is a matter of planning and control, of direction and inspection, of methods and machines. On another side, it is a question of so directing and motivating men and women as to secure their co-operation in the plans and purposes of those responsible for the direction of the factory. But the factory is not an end in itself, it fails of its purpose unless it is linked up with the market. The major activities of merchandizing and advertising are the preliminaries to the vital processes of selling and transport. Finally, records are essential to good administration, and must cover all the aspects of the business, including production quantities and costs, wage records, sales statistics, and the various aspects of accountancy.

Each of these subjects is dealt with in the pages which follow. The authors hold that detailed, analytical thought on business problems is one of the greatest needs in the world of industry to-day. The day of science, which is at

full noon in research laboratories and elsewhere, is only dawning in factory organization. The application of the scientific method involves primarily an analysis of situations to find all that is involved within them. It is the method of inquiry, analysis, comparison, and standardization. The authors have sought to follow out all the implications of their subjects, and in so doing have reached out towards the second and synthetic aspect of science. They have set out proposals for organization and management, not in the form of platitudes or preachments, but as devices, proposals, and suggestions arising out of their analysis. Just as his knowledge suggests hypotheses to the research student, so do thought and inquiry prompt improvements and suggestions to the scientific business man. The authors cannot hope to have done more than to start more systematic inquiry and more constructive thought upon problems of factory organization, but they have with full intent endeavoured to give such an impetus towards more efficient management.

CHAPTER II

THE ORGANIZATION OF BUSINESS CONTROL

BY OLIVER SHELDON, B.A.

AN organization comes into being as an outcome of several persons joining together to further a given project. The larger the enterprise, the more complex the organization, but, however small it may be, and whatever its object, there an organization exists. An organization is not something one can hold or reject at will ; it comes automatically into existence, when a common object is adopted by a group of co-workers.

I

THE PROBLEM OF ORGANIZATION

With the expansion of an undertaking, problems of organization become more numerous and urgent. In the small concern, arrangements made in a few moments may suffice ; in the larger and growing concern, such arrangements are more difficult to make, and, when made, may not work smoothly or economically. Hence, in large undertakings, if effective results are to be obtained, it is essential that the form of organization and the methods of its operating should become the subject of the most careful study and planning. The problem may not be recognized, and it is true that many businesses have expanded and won success without more than a passing thought on, still less a scientific approach to, the subject.

Nevertheless, modern industrial conditions do not any longer permit of careless or haphazard organization. The competition with which British industry is faced from abroad and the difficulties which beset it from within have sounded the death knell of "rule-of-thumb" methods. The movement towards scientific organization in France,

Germany, Italy, and the United States of America have placed this subject in the forefront of those to which the progressive business man must give attention.

Modern industrial undertakings, however—a fact we are often apt to forget—are but children amongst the great enterprises of the world's history. It is barely 100 years ago that limited liability companies came into being. Organizations, however, there were, as great as any modern business concern. In the main, they were the organizations of the State—the Army, the Navy, the Civil Service—and of such public bodies as Universities and the Church. Those who, to-day, stand in responsible positions in industry and flatter themselves, perhaps, that they are taking their share in the construction of enterprises such as the world has never hitherto seen, might well be reminded that, long before industry, as we know it, had taken shape, the principles of sound organization were already being discovered, expanded, and applied—the selfsame principles that industrialists to-day are hailing as discoveries. This is not the place in which to illustrate sound organization principles by examples from spheres other than industry. It is a profound mistake, however, to imagine that an industrial organization must be built up on lines dissimilar to those on which other organizations have been erected. Details will, of course, differ; principles, however, will be the same. To organize effectively has ever been one of the major problems of mankind in all man's multifarious activities, and, to contend that principles, compiled from the experience of the past in many spheres, are inapplicable to modern industrial undertakings, is both reactionary and shortsighted. Organizing is not simply the making of what one may call "common-sense arrangements" about work, any more than weaving, let us say, is the making of common-sense arrangements about cloth, or modern advertising is the making of common-sense arrangements about space in newspapers. In all these activities, a technique has been, or is being, laboriously evolved, embodying

certain "laws" or principles, which carefully sifted and tested facts have proved to be true. The principles of organization have yet to be set out with the precision which would rank them with the "laws" of other sciences. It is important, however, that, from the outset, we should realize that, in discussing the subject of organization, we are reviewing a developing science, covering a wealth of knowledge, and having already reached a stage where one might legitimately claim that certain principles have been established.

II

DEFINITION OF ORGANIZATION

Organization is the process of assigning duties to individuals or groups, selected for the purpose, so as to achieve specified ends effectively and economically through the co-ordination and combination of all their activities.

It is, of course, vital to understand precisely the significance of this much-abused word. Like most indefinite nouns, it lends itself to indefinite speech and is a convenience for indefinite thinking.

"Organization," says Sir Ian Hamilton, "is the art, or science, of building up a symmetrical whole by a number of parts, just as the human frame is built up by heart, liver, brain, legs, etc."

"Organization," says Mr. J. W. Schulze, "is a combination of the necessary beings, materials, tools, equipment, working space and appurtenances, brought together in a systematic and effective correlation, to accomplish some desired object."

"Organization," writes Mr. L. V. Estes, "is the arrangement of dependent parts or functions, so as to show their inter-relation in the structure and to provide the means whereby the efforts of a group of individuals will be directed rationally towards a common object."

If we examine our definition, certain essentials will be

seen to stand out clearly, which at this early stage, we may briefly enumerate.

Firstly, organization is a "process." It is a conscious, purposeful activity, the building of a structure, according to plans and specifications. Moreover, since the structure is fashioned of men and women, organization is a continuous process, requiring the constant care of those responsible for it. As each new activity begins, it must be properly located in the organization. The finest organization will slide into ruin unless the care with which it was originally planned is exercised continually.

Secondly, organization is primarily concerned with "duties," the grouping into various units of the sum total of the responsibilities to be carried. Skill in organizing consists largely in fitting jobs and men suitably together, but the original starting-point in planning a sound organization is the analysis and distribution of the work. Any modification of the proper division of the work, to suit the particular capabilities of an individual, may be desirable, but it is, and must be recognized as, a departure from the ideal, and, moreover, a departure which can at best only function satisfactorily for a temporary period.

Thirdly, an organization is a means to an end ; organizing is the devising of the best methods for achieving that end. It follows, therefore, that the end must be definite and known to all concerned, if it is to be the criterion by which the efficiency of the means is to be judged. An organization is not, and cannot be, an end in itself. The methods of working are determined in order that they may contribute directly and effectively to the ends set up. By allocating duties to various individuals or groups, the organizer, as it were, automatically determines the methods.

Fourthly, organization must ensure the fullest possible co-ordination of all the activities which are being carried out in the enterprise. Without that co-ordination, it would be impossible to say that the "ends in view were being effectively and economically " pursued. Organizing

is itself a co-ordinating activity. It is the linking together of various units so that when each effectively performs its part, the total effort of all achieves the result planned for the business as a whole.

Fifthly, in a good organization, the job cannot wholly be regarded as distinct from the person or persons performing the job. Although the organizer will first plan his organization irrespective of persons, it is clear that the success of his plan must depend upon the ability displayed by each official who performs a "job." An organization, therefore, is a compound of duties to be performed, and persons appointed to perform them. To fit the twain harmoniously together is an essential feature of a sound scheme of organization.

Sixthly, organization presumes that certain means are available for the purpose of executing the jobs which constitute the organization. It is not the task of the organizer to say that one machine is better than another, or that an operation done by hand could better be done by a machine. His task finishes when he stipulates that a certain activity must be carried out by a certain individual or unit. How that individual or unit performs the work is not directly the responsibility of the organizer, though changes in operating methods may lead him to make changes in the organization.

Such is sound organizing—a comprehensive and all-pervading activity, linking many units into one cohesive whole, welding many human faculties into one powerful instrument. It is the fitting of part to part, section to section, till the whole complex mechanism is erected and becomes a smoothly running machine. It is the bringing of system into the sphere where it works; the regulation of effort so that every endeavour may yield its full harvest. Completed, an organization evolves which is indeed the framework of any enterprise—the whole system of channels and canals through which work flows. Organization neglected, it is as if the house were built on sand; scientifically

pursued, it is as if the foundation were a rock on which the house will not be shaken. To what is small, a sound organization offers the steelwork of expansion; to what is large, it affords the foundation and security of solid structure.

III

THE MEASURE OF SOUND ORGANIZATION

By what measure, then, can one assess the effectiveness of a system of organization? When is it good, and when bad? What constitutes a sound piece of organizing?

Whether an organization be sound or unsound depends on the efficiency with which it achieves certain ends. These ends, in turn, are relative to the ultimate objects of the whole enterprise. Organization, it must ever be remembered, is not an end in itself; its purpose is to facilitate the task of achieving other goals. The primary test of organization, therefore, is the degree to which it enables work to be executed economically and easily. A poor organization is one where the execution of work is unnecessarily complicated, roundabout, or haphazard. Advisedly one says "unnecessarily," since the direct method of executing work, though it may be simple, may not be the most effective. It may, for example, be simple enough for the Managing Director to discharge the office boy, but if, in doing so, the Managing Director leaves out of account his office manager, the resultant confusion of responsibility may have the effect of rendering the office control inefficient—a contingency which no degree of satisfaction to the Managing Director, in so relieving his feelings, could justify. A sound organization is one where every necessary activity is initiated and carried through with the minimum of trouble and the maximum of effect, taking into account all whose duties compel them to take a share in the activity. It is not enough, however, to apply this criterion to one single activity. An organization is only sound where all the activities of the enterprise are carried out

simultaneously under these conditions. In an orchestra, one player may be playing his flute to perfection, but if the others are not so expert, or if they are playing another portion of the symphony, the effect of the whole will be far from ideal. An organization cannot be sound unless it is sound in every part; and, conversely, it cannot be sound in every part unless the whole be directed to the same end.

If one unit in an organization be well organized and one poorly organized, the net total is an unsound organization. Furthermore, if one unit be well organized for its own internal working, but be inadequately adjusted to other units, the result must again be unsound. It will be clear, therefore, that the effective organization of a large concern, divided into many units, implies that every unit, whether it be a larger one, or the smallest of all, must be organized on the same principles and to the same system. It follows, accordingly, that the control of the organization must be a central control. The full benefits of good organizing will not be realized in a business, unless departmental systems interlock effectively, and conform to the plan for the whole.

Co-ordination.

These considerations lead one immediately to the second main aim of good organization. For work to be smoothly and economically executed, a good organization must ensure that the performance of the work complies with the requirements of those who exercise supreme control of the undertaking. This presumes that the organization is such that this highest control has the means whereby it can effectively and easily regulate the execution of the work. To provide these means is the task of the organizer, and control of the organization itself is one of the main means to this end. Organization is the determination of how work shall be divided, so that it may be economically and efficiently carried out. The chief executive, therefore, by controlling the form of his organization, possesses an

effective tool for ensuring that work is carried out in a co-ordinated manner. No organization can be regarded as completely sound which does not permit of this effective co-ordination from the top. To ensure this, the chief executive must hold within his own grasp the decision as to how the organization shall be built up, so that he may regulate every extension, and determine every change in the light of the plan which he is pursuing for the whole enterprise. A complex piece of mechanism cannot be built up into and maintained as a serviceable working unit, unless every part complies with one design, and the ideas of each builder are subordinate to one central purpose. Sound organization spells cohesion, consistency, combination and co-ordination. However successful or progressive one branch may be, it is a danger to the structure unless it adheres to the outline of the whole building.

Capacity for Expansion.

Following on this thought, we meet the third main aim of good organization—to ensure that the enterprise is in a position to grow and expand, without dislocation, despite changes in persons or methods. The organization-builder cannot simply fix his eyes on to-day or to-morrow ; he must build a fabric which can stand through the years. He cannot afford to suit his erection to the needs of the moment and the people of the present. He must build for permanence. The structure of an organization, however, is not composed of brick and stone ; it is a living structure, and human life carries ever in its heart the seeds of decay. Human beings perish, or pass from one enterprise to another. It is, therefore, short-sighted to plan an organization to fit the personnel, who may happen, at any given moment, to form the staff of a business. An ideal organization, if it is to be stable and secure, must be planned to provide for the proper exercise of normal capacities ; it cannot safely provide a niche for the abnormal. If it be sufficiently elastic, provision may be made for the exceptional man

fulfilling the duties of two normal positions in the organization, but those two positions should not be regarded as one, because for the time being one individual holds them both ; nor should greater authority be ascribed to such an individual than that which is implied in each position separately. The organization which is modelled to suit the capacities and peculiarities of particular individuals may succeed for a time. It is, however, like the seed which fell on thorny ground ; it can only flourish whilst the temporary conditions, for which it was designed, continue to exist. With every change in personnel, the organization must be changed, and the results can only be confusion leading to unsatisfactory working. However specious may be the appearance of an organization designed to suit individuals at any particular time, its foundation cannot but be shifting sand. This, indeed, is the most insidious temptation which assails the organizer. A little departure here, a little compromise there, with what he knows to be a sound principle or a scientifically determined practice—and, before long, he finds himself regretfully struggling to regain the heights from which he slid. Departure from sound principle can never be completely justified ; it can only be regarded as expedient when the way back to that principle is as clearly marked out and planned as the departure itself.

Use of Man Power.

Thus we pass to the remaining major aim of good organization—to make the best and fullest use of the available human power. The operative components of an organization are human beings. The art of organizing is to locate human beings in the structure so that each consistently contributes what is required of him to that entirety of work which is the conduct of the whole undertaking. Human faculties differ, as individual human beings differ, but the two are not the same. The organizer cannot, in building his edifice, distinguish between the idiosyncrasies and peculiarities of individuals ; but he can, and must,

Distinguish between the type of mind which is essentially analytical and that which is essentially empirical, between the scientific mind and the mind which dominates, commands and leads, between the man who is scrupulously accurate and he, who, wildly inaccurate, yet often strikes a supreme idea. He must further take into account, if his organization is to operate to the best advantage, the general needs of human beings—the needs which arise if effective working is to be secured. He must recognize that men must be given complete jobs, carefully defined, if they are to feel a full sense of responsibility; that jobs must not overlap if friction is to be avoided; that accountability to superiors must be precisely planned and understood if petty bickering is to be averted. These and other considerations must guide him in determining whether his plan of organization effectually achieves the ease and economy in working which is his main objective. We speak of an organization as a machine, but each cog and shaft is a human being. If, therefore, the machine is to run easily and efficiently, the conditions must be such as will induce human beings to work easily and efficiently. Friction, worry, insecurity, lack of facilities for the full exercise of powers, irresponsible restrictions on promotion, absence of proper incentive, lack of knowledge as to where one stands—these are the grit which clogs the wheels. No organization, therefore, which fails to make provision in its design for avoiding these conditions can comply with the test that there is efficient working of the machine. It is in this respect that the organizer makes his supreme contribution to the harmony, goodwill and co-operation of industry. His is not the invidious task of applying palliatives; his task, rather, is to make palliatives unnecessary. He is, in a sense, the most responsible of welfare workers, for, by efficient organization, he can remove many of the causes of discontent which are liable to arise in everyday working, and which vitiate the whole atmosphere of industry. Efficiency in organization is, indeed, to carry out

the most enlightened labour policy. It must, therefore, be a primary aim of sound organization that those who compose the organization can, in so far as the distribution and delimitation of duties are concerned, work freely and wholeheartedly, without friction, jealousy, or a sense of repression.

IV

BUSINESS POLICY

In our discussion thus far, the reader will have gathered that it is impossible to consider the subject of organization apart from the objectives which the particular enterprise aims to achieve. Before an organization can be designed effectively, these objectives must be determined and defined. In other words, the business must have a "policy," that is, a scientifically determined plan defining these objectives and governing the methods to be adopted, under given conditions, in pursuit of them. The responsibility for the determination of policy lies with those who exercise the direction of the business, the policy in turn forming an instruction to the management. The following definition may serve to bring into focus the many ideas this much-abused word should convey.

"A policy is an accurately determined directive control which is based on definite and adequate knowledge, and which designates the aims of the business and the approximate methods to be used in their accomplishment. Policies contribute the foundation upon which the business is built and the basis upon which rest the direction and control of its performance. . . .

"Thus, policies function as a general delimitation of the field of operation and outline the course which preliminary survey has proved to be the best for the business to pursue. . . . Policies are fact-founded directives and controls, and should furnish not only a definite goal for the business, but also a definite plan for reaching that goal."¹

¹ *Fundamentals of Business Organization*. Webster Robinson, 1925.

The beginning of sound organization is the determination of sound business policies, based on knowledge of the conditions which the business must encounter and of the potentialities which lie within the business itself. There is, of course, no criterion by which one may assess whether a policy is sound or unsound. Experience in applying the policy alone can provide the ultimate test. It must, however, be a condition of policy-making that policies are only determined after the fullest possible consideration of all the established and available pertinent information and facts. Only if founded upon a basis of proven facts can any policy reasonably expect in practice to succeed. It is little short of folly to adopt a policy, with every intention of applying it, if the policy has not a scientific basis of fact and knowledge. Policies should be the outcome of intensive research and constructive thought on the results of the research.

Nevertheless, it is often true that the absence of any clear policy is a worse condition than the existence of a clear policy which is wrong. Absence of policy means, in effect, that a multiplicity of policies exists, none of which bears the stamp of authority. This directly conduces to chaos. A clear policy, on the other hand, however mistaken it may be, does at any rate facilitate unity of action throughout an organization, and can, moreover, be changed with a minimum of difficulty. A wrong direction can be swung into a right direction, but chaos can only slowly and with infinite patience be brought into order.

Responsibility for Policy.

It is often true, again, that a policy which is perfectly sound may be ineffective, because of some flaw in the responsibility for, or methods of, policy-making. It is important, for example, to determine precisely who is responsible for framing policy, to define as closely as possible the subjects on which it is necessary to formulate policies, to fix the form in which a policy shall be expressed,

so that it may be clear, intelligible and complete, to make provision that a policy may be determined at the right time, and to plan the steps by which the policy, once settled, may be translated into action. It is of no avail for a group of executives to frame a policy, however excellent, unless that policy is clearly interpreted to those charged with putting it into effect. Policy precedes action, but is nothing without that subsequent action. Much, therefore, depends upon the adequate publication and explanation of a policy, and the steps which are taken to follow up its execution.

Policies, properly conceived, do not provide specific direction on detail but rather, by setting up objectives and ordaining general methods of operation, leave the initiative in detail to those responsible for applying the policy. Policies set the goal and the general line of march ; the order of advance is determined by the executive staff.

The responsibility for determining policy clearly rests with those who direct a business. Policies are the finger-posts directing executives to the ends which it is desired to reach. Policies, therefore, must come from above ; they cannot well up from beneath. The responsibility is one which cannot be delegated or passed to subordinates ; it is the inalienable privilege and responsibility of direction.

There is, therefore, a clear line of demarcation between those who determine policies and those who execute them. This line of demarcation lies at the root of sound organizing, for it is the primary division of the activities of any business—the line dividing those directing and co-ordinating activities which one may group under the title of Administration from those executive activities normally described by the general title of Management.

The Task of Administration.

Administration is not alone the process of determining policy, though this forms a vital and distinguishing part of it. In general terms, it is the task of guiding and co-ordinating a business as distinct from the supervision and

Execution of everyday duties in the business. The administrator guides by formulating policies; he co-ordinates by ensuring that the policy is being carried out, by methods previously planned, through the organization which he has devised. To ensure this, it is, of course, essential that each unit in an organization should play fully the part allotted to it. Those who perform the duties of Administration, therefore, must exercise that very necessary co-ordination, by means of which all the diverse units of an organization operate collectively as one whole. They must gather together to a focal point all the component activities of the business, which they then propel towards its pre-determined objective.

In terms of persons, Administration may be regarded as a covering title for the duties which fall to the lot of Directors and of the head of the executive organization. For instance, in a business controlled by a Board of Directors and a Managing Director or General Manager, the duties of these officials would constitute the Administration of the business. In another instance, perhaps, Administration might cover the duties of a Board of Directors, and of two or three of their members whom the Board may have appointed to take immediate and active charge of various branches of the business. Administrative arrangements may differ between various businesses, but their scope remains constant—the framing of business policy and the ultimate control of the activities set up to achieve that policy.

The Task of Management.

It will be clear that the duties which fall within the sphere of Administration differ, in degree and in kind, from those which constitute the scope of what we have called Management. Whereas the one is determinative, the other is executive; and, where the one directs, the other is under direction. The administrator plans the course; the manager sets the wheels moving; the administrator holds the reins; the manager pulls between the shafts. The two

spheres of organization are complementary, but vitally distinct. They call for different qualities ; they necessarily operate under different conditions ; they are mutually injurious if they are intermingled. Yet they are inevitably inter-dependent. Without guiding policies and co-ordinating control, Management becomes an army in disarray—a force dissipating its vigour, for lack of guidance and cohesion. Without Management to grapple it to earth, Administration becomes but a circling fancy—an eye which glimpses the star, but whose wagon is a dream.

To ensure that each is provided with the means to operate effectively and that both are linked together, without either losing its identity, is the task of Organization. Organization plans and lays out the rails on which they must run ; it is the great facilitative function of business—the whole mechanism of jobs and men, the railroad system, as it were, on which Management drives forward to the heights which Administration would make echo with its iron wheels.

V

ADMINISTRATION

When one comes to review the organization of any business, it may not be easy to distinguish those who constitute the Administration from those who carry on the Management. The Managing Director may do a great deal more than exercise a general control of the whole. The Directors may occupy themselves with many points, which would hardly justify the convenient title of " matters of policy." Or, the Directors may not have determined a definite policy and may leave each Manager to fashion his own policy, only assessing results by the yearly profit or loss.

This difficulty may be due to a weakness in the organization or to derelictions of duty on the part of officers concerned ; but we should not forget that it may also be attributable to the size or formation of the particular

business. In larger concerns, if they be strongly and effectively organized, there should be no difficulty in discovering those who form the Administration, as we have defined it, and those who constitute the Management. There will probably be a Board of Directors, and either a Managing Director or a General Manager. These, together, should perform the duties which we have grouped under the head of Administration, provided, of course, that the administrators limit themselves to purely co-ordinating work, and do not directly control any particular branch of the management. Another business may, on the other hand, have several Managing Directors, or may, perhaps, be a partnership, the partners actually busying themselves with the buying or manufacturing or selling. In such cases, it will be clear that these officers come within the scope of Management, when they instruct buyers what or when to buy, or salesmen what or when to sell, but come within the scope of Administration, when they meet to settle a policy, to review the results of the business or to authorize an expenditure of capital. They, therefore, act in a dual capacity, and, though exigencies may require this particular form of organization, it is supremely important that they, themselves, should distinguish clearly between the two rôles they fill. In smaller businesses, similar difficulties are more certain to arise. A small business cannot afford, nor does it require, the distribution of duties between many individuals which is inevitable in a large concern. Nevertheless, however small the business, there is much to be gained by a careful analysis of what each individual actually performs and by distinguishing sharply between the various capacities in which each acts at different times.

Whether, therefore, one speaks of a large or of a small enterprise, the two major groups of activities—Administration and Management—are always present, even though the same people may perform duties under both heads. Every business must be administered, and every business managed; it is for the organizer to distribute the work

involved between the individuals concerned. His first task should be the organization of Administration, for a sound business enterprise is, above all else, one which is securely and precisely organized at the head.

The Board of Directors.

The work of Administration, as we have seen, is, in terms of persons, the work of Directors and of the chief executive officer of the business. As has been suggested, Directors may, of course, act in various managerial capacities, in addition to carrying out their duties simply as Directors. At this stage, however, we are only concerned with their inalienable duties as members of the Board.

Present practice varies very considerably as between different concerns. In some—one may hope and believe, a decreasing number—Directors do little more than perform certain more or less perfunctory duties and attend to certain routine formalities. In others, they certainly exercise, to a greater or less degree, their rights and responsibilities, by bringing to bear a considerable influence on the determination of financial and general policy. Often enough, however, their interest is confined mainly to authorizing capital expenditure and pursuing the staff for a return on such expenditure. Usually, too, they give consideration to the various legal points which arise in every business, and, for these activities, it is right to presume that they have a fair knowledge of the law and of that mysterious subject known as “high finance.”

These matters, of course, are important, but they do not by any means cover the whole duty of Directors. Their primary task, in carrying out what we have named the Administration of a business, is to determine the policy that the Company shall pursue, in order that a reasonable return may be earned upon the invested capital and that the assets of the Company may be kept intact. This is not simply a question of determining financial policy; policies must also be determined for production, selling,

advertising, research, labour, and organization. No business can claim to have considered every factor making for success unless it can show a clear policy on each of these subjects, and it is for the Directors to determine these policies. They must, therefore, jointly have a general common-sense acquaintance with every branch of business practice, and be able intelligently to plan, criticize, and construct policies to guide the managerial staff in carrying out these various activities. Directors should also ensure that the Company is so organized that the policies which have been adopted can be adequately carried out, and that it is so staffed with trained, efficient and progressive managers that a team strong enough to carry through the proposed programme is available. It is not enough to frame a policy ; it is essential to provide and maintain an organization competent to execute the policy. It is, furthermore, the duty of a Director to take steps at intervals to see how far the agreed policy is being carried out, and to what extent it is proving successful. This he will be able to do, in part, by the scrutiny of figures and reports, devised to show the relation of what was intended to what is actually happening, and in part by observation and conversation with those concerned. In order to examine figures, reports, and circumstances intelligently, he must necessarily be alive to tendencies and events in the trade in which the company is engaged, and must be prepared to criticize and suggest lines of development. Moreover, in order that the broad lines of policy may be rendered directly applicable to the current circumstances of the business, he should obtain from the management and give his approval to the more detailed and immediate programmes and budgets which the Management should prepare for the working periods ahead, and again should take steps to compare actual progress—in sales, production, and expenditure—with that set out in those plans.

These are the duties of a Director which primarily affect the prosperity of an enterprise. It is vital to success,

firstly, that these duties should be efficiently executed ; and, secondly—what is equally material—that they should be executed by none other than those charged with their performance. Directors may, and often do, rely upon the Management to carry out these duties on their behalf. It is, however, a dereliction of duty, and, further, an imposition upon the Management which it should not in fairness be asked to shoulder. Management is executive ; it will, if it is efficient, achieve the ends which are set before it, but it cannot legitimately determine those ends. It is for the owners of the capital, through the Directors they appoint, to resolve what it is they wish to be done with their invested capital. A Board, therefore, which does not specify its policy, or, having specified it, does not check its application, has only itself to blame if results which are financially unsatisfactory accrue.

If it is important, however, to determine the duties which fall to the lot of Directors as members of a Board, it is equally important to settle where those duties end. Some Directors, without thought, and actuated often by zeal, confuse in practice the duties of the Administrator and the Manager. They concern and busy themselves in details of everyday supervision ; they issue instructions, and undertake to examine and legislate on matters which are the responsibility of one of their Managers. Action of this kind impinges on the responsibility of Management and tends to confuse the smooth working of the machine, while, at the same time, often leading the Director concerned to neglect his proper and legitimate sphere of responsibility. To give advice upon, or to examine managerial activities is, of course, the right of every Director, but the issue of instructions on such matters is clearly the responsibility of the officers whom the Board has appointed to manage the affairs of the business.

The Need for Thinking.

Neglect of, or ignorance of, the duties which the Director should perform, lies at the root of a large amount of business

inefficiency and failure. The work of Administration is primarily the immensely difficult task of "sitting and thinking." Modern business suffers exceedingly from the lack of such thought. For some men, deliberate and constructive thinking is an intolerably burdensome pastime. Many are men of valour and action, brimming with energy and eagerness to see results. Some men, frankly, cannot think; some are too impatient; some too lethargic, some too full of affairs. Some think they think, and some think all the time, while some think differently every time they broach the hazardous task. Yet dauntless, dispassionate, scientific thinking by business leaders is acknowledged to be an imperative need of every modern business—the thinking which evolves plans of action and forecasts results from causes. Such thinking must, of course, be alive to realities and must ultimately conduce to that other great attribute which belongs to those who lead—decision. It is, however, a habit which is sorely neglected. It is often relegated to the last few moments before a decision has to be taken, and then becomes inchoate thinking, for it necessarily is conducted under pressure and without data. Directors can make no greater mistake than, for whatever reason, to fail to devote time to truly analytical and far-seeing thought on the path the business must follow, for it is they, above all others, who are appointed to accomplish this work. Without such deliberate thought, coupled, as it should be, with a tutored imagination and a wideawake observation, there can be no surety of consistent, firm, and dependable leadership. It is comparable to the folly of the commander who does not plan his campaign, relying only on the tactics of the moment to achieve victory.

The Chief Executive.

The Board will normally appoint one or more of its members to act as Managing Director or Directors, or it may prefer to appoint a General Manager who is not a Director. The function of such an officer is administrative

in the sense we are using the word, but is to be distinguished from the function of a Director pure and simple. He stands midway between Administration and Management—the vital link between the deliberative and the executive functions, the interpreter of the one to the other, the responsible head and chief executive. His primary duty is so to co-ordinate and direct the forces at his disposal that the objects which the Directors have established shall in practice be achieved. His position is the supreme strategical post in any organization ; it demands a degree of ability far beyond the commonplace. It requires the faculty to interpret policy in actual programmes of work, the genius which impels a whole organization voluntarily and unitedly to press forward, the systematic capacity to link every unit together so that the whole is an efficient and progressive entity, the unwearying effort which alone can keep the steps of all on the path which has been planned.

Interpretation of policy is the beginning. Fortunate is the Managing Director who has received from his Board a clear, concise policy ; but, even presuming such a rarity, difficult indeed is his task in imbuing every member of the organization with his policy. He must be a teacher and a lecturer, with the expository powers of a Socrates and the patience of a Job. To these he must add the commanding strength of a Caesar, for to him is entrusted, as much as to any Caesar, the baton of leadership.

The co-ordination, however, exercised by a Managing Director or General Manager, can only be fully effective if it operates through an adequate mechanism. There must, firstly, be a clearly defined and carefully planned organization. Responsibility must be precise, clear-cut and definite ; there must be no overlapping of duties or duties which belong to nobody in particular ; there must be precisely understood degrees of responsibility, so that each individual knows to whom and for whom he is held responsible ; duties must be divided between departments and individuals in such a way as to promote economical and

simple operation. The organization is the means by which the Managing Director obtains results. He should allow no tampering with it; he should permit no departure which does not conform to its general outline. In this control of the organization he is exercising the first essential part of his co-ordinating function. If he be wise, he will set out in writing the plan of the organization, laying down in precise language the duties and the degree of responsibility of each individual, and the procedure to be followed in carrying out the work, whatever it may be—whether an operative process or the execution of some particular piece of management work. By this means, he will be able to check practice against the standard, and so keep the whole conduct of the work within his grasp.

Co-ordination of Results.

The Managing Director must also co-ordinate results. It is not enough to ensure that the organization is functioning smoothly; he must also ensure that the results obtained—in sales, in output, in profit—are reaching the required standard. His “measuring-stick” for this is what is known as the Budget. Every progressive business should, at the beginning of a period (say a year) prepare its budget. This consists of (a) an estimate of sales, (b) an estimate of expenses of all kinds, (c) an estimate of profit. To enable this to be satisfactorily carried out, many preliminary plans must be prepared—plans of advertising, plans for special selling campaigns, plans for expenditure. Comparison of actual results with the budget will enable the Managing Director to see how far the anticipated progress of the business is being in practice achieved. It will be necessary, of course, to establish machinery for the proper control of expenditure, so that expenses are not lightly incurred which are not allowed for in the budget. In this way, the Managing Director may know, at any moment, if he be provided with the necessary figures, how far the profit which he planned to obtain is actually coming to hand, and

can locate the cause of any discrepancies. A budget is the second essential piece of machinery by which to secure effective co-ordination.

The Time Factor.

The Managing Director must also devise some machinery for the close co-ordination of the times when various activities are to be carried out. However effective the organization, and however satisfactory the system for planning and checking results, no business can be said to be working to the maximum efficiency unless the "timing" of all the work is perfectly co-ordinated. Each individual or department must perform its allotted task, not only to "standard" methods, at a "standard" cost, but also in a "standard" time. Delay is one of the most ubiquitous forms of waste; it almost invariably entails confusion and haphazard methods. The Managing Director, therefore, should draw up a statement of the times by which at any rate certain key operations—whether managerial or operative—must be accomplished, and check actual times with the schedule.

It is by the control of the organization, of income and expenditure, and of time, that the Managing Director in the main can effectively exercise co-ordination. He has other duties, naturally. He must watch costs; he must sympathetically examine the progress of each individual manager; he must watch products and study markets. But, above all, he is a "co-ordinator," pulling first this, then that string, in order that the whole may move and function according to plan. He must keep free of the entanglements of detail, remembering that he cannot successfully pull the strings if his own feet are entangled in them. The essence of his task is to straighten out complications, to plan ahead, to watch progress and direct remedial or constructive measures, but not to take personal hold, as Managing Director, of any but the duties of a central controller. He must not forget that, demanding an

effective, working organization, he, himself, is the keystone of that organization, and to the extent that he, himself, departs from the strict sphere of his co-ordinating duties, the whole organization slides askew. No organization can work to sound principles of organizing unless the keystone to the whole remains fixed securely in its vital position. }

VI

THE TECHNIQUE OF MANAGEMENT

Dependent on Administration for direction, but, in each of its branches, employing a technique of its own, is that broad group of activities we have christened Management—the task, in general terms, of carrying out the policies of the business and of controlling and supervising the available means to that end. Management includes all those who, in any degree, hold responsibility in the organization—those whom we usually designate as managers, foremen, supervisors, technicians or clerks. It is a varied yet homogeneous body, for, whilst each practises some particular technique and all stand in varying relationships to each other, the operating of the business as a single unit depends upon their close and balanced interworking. They are executive, in the sense that they are responsible for the manufacture of the Company's products, their sale to customers, the purchase of the necessary material, the advertising of the goods, the keeping of the books. They execute these activities, on the lines laid down for the general conduct of the business, and exercise control and supervision by means of the organization provided.

The problem of organization is how best to divide these manifold activities into workable related units of responsibility. There are several paths open ; in actual practice, it is rare to find any one path consistently followed. The safe path is to approach the problem of organization as one would address any intricate problem—by the scientific method, “ in the mood of those who work at widening the

boundaries of science, with the tools used in that work. The mood is one free, so far as may be humanly possible, from prejudice. The tools are few and simple. They are the measurement of things, with the greatest precision for which we can devise instruments of measurement, the arrangement, classification, and interpretation of the results of those measurements, and the testing of those interpretations against the facts of experience."¹

In a word, the analytical method must be used and the work to be done analysed as the scientist would analyse water or a mineral. After analysis, the work must be re-arranged by classifying it into various groups having a common link, and what we deem to be the arrangement most suited to achieve the aims of sound organization must be standardized.

The Responsibilities of Management.

What, then, under modern conditions, is Management required to do? What are the activities which a modern business must carry out? Obviously, the normal manufacturing and wholesaling concern has to buy and make goods, sell them, and keep a record of its transactions. These constitute the three main divisions of the work of any business, and are usually referred to as Production, Distribution, and Finance. Modern conditions, however, require many activities to be undertaken which, fifty years ago, or even less, lay almost beyond the dreams of industry. Our forefathers knew little or nothing of the ramifications of modern advertising, the high technicality of modern scientific research, the intricacies of modern book-keeping, the precision and detail of modern costing and statistical work. Management to-day is no longer simply the application of native common sense and wit. To these must now be added specialized knowledge and expert ability in many different fields. Management has to be learnt, like a science; it is coming to be practised, like a profession.

¹ Letter to *The Times*, June 15, 1926, by the Industrial Institute.

Just as the doctor must study medicine in its various phases, so must the manager study Management. The Science of Management is beginning to be built up ; its practice is still largely empirical, but the value of scientifically ascertained knowledge is steadily achieving a wider recognition. The developments which follow upon the growth of large businesses, the persistent stress of competition, the golden harvests which scientific research is offering, the stern demand for better quality and reduced costs, and the echoing call of the workers for that higher standard of living which is their birthright, have all contributed to render the art of management a task of increasing complexity requiring specialized skill and unremitting effort. It is not enough now to trudge along the same old pathway, trodden by the pioneers of modern industry. They hewed their way through forests and across ravines, imbued with the faith of the explorer and buoyed up by the courage of hardship. Their rough track has been widened and hardened into a road, and the instruments which served to fell the trees and crush the roots which stood in their way no longer serve. The whole scope of Management has expanded with each new necessity ; it embraces a vastly wider range of activities, and each activity is conducted by abundantly more varied and complex methods. It is this complexity which, of itself, compels the careful planning of the organization of a modern industrial concern.

What, then, under modern conditions, are the responsibilities of those who constitute the management of a business ? They must control production, of course ; keep accounts, and maintain records and statistics of many varieties. They must buy what is required of raw materials, packing materials, tools, etc. ; install and maintain the necessary plant and machinery ; and devote effort to research work in various directions. They must plan production to accord with the volume of sales ; design the products of the business to meet the market demand ; control the selling of the manufactured goods ; conduct

some form of publicity ; and control or arrange the transport of goods to customers. Through all these activities must pass the golden thread which links all together into one flexible and cohesive whole.

Each of these activities is divisible into many parts, and each section is again divisible into still more units. On what plan, then, is all this conglomeration of work to be organized ? What plan will conduce to the most effective system of working and yield the best results ?

The " Departmental " Plan.

There are three recognized principles of organization, generally known as (a) the " departmental " principle ; (b) the " staff-and-line " principle ; (c) the " functional " principle. The " departmental " scheme of organization normally assumes the existence of the three main divisions of business—Production, Distribution, and Finance—and divides each of these into certain self-contained departments. For instance, under Production, the work of producing the goods would be divided into several operative departments, each completely responsible for producing one or more products, and the head of each department would be held responsible for everything affecting the processes employed in his department. He would buy his own materials, design his own products, engage his own labour, pay his own wages, keep his own records, set his own standards of output and cost, and earn his own profit. This form of organization is sometimes referred to as the " military " form of organization, but such a name is misleading, for modern military organization is not framed on these lines. There is, however, in this form of organization, a satisfying sense of completeness. It makes each head of a Department monarch of all he surveys, and the monarchical system is a form of government which, given an efficient monarch, often enough achieves supremely satisfactory results. It is, however, a form of organization which depends for success very largely upon the ability

of a single man, and, to be effective, that one man must be equally able in every direction. He must be as efficient in his buying as in his manufacturing, in his leadership of labour as in his technical process work. Failing this, inefficiency in one direction must to some extent negative efficiency in another direction, and, although this form of organization may make possible a Profit and Loss Account which does actually reflect the personal ability and success of the Manager, it may well be that waste on one item may cancel a high degree of efficiency on another item. To reap the fullest results, it is necessary that every activity of the manager should be equally effective. Men who can comply with this condition are rare.

There is a tendency for small businesses to organize in this way, because the scope of each activity is small. The manager will happily conduct his own buying, since the amount bought is inconsiderable ; he will engage his own staff, because he knows just what he wants and he only engages a new worker now and again ; he will prosecute his own research work, because it is not often, if ever, that he feels the need for it. This, however, is contrary to one of the main aims of good organizing, as defined earlier in this chapter—that a business should be so organized that it can grow and expand without dislocation, despite changes in personnel. A business organized on “departmental” lines cannot comply with that aim. As suggested elsewhere, however, “the effect of the ‘departmental’ form of organization is, as it were, to impose a glass frame on sunflowers. . . . When the manager is fully occupied, growth stops ; or, if it goes on, it continues outside the province of his control. It creeps outside the glass frame, and is wasted.”¹ In other words, the tendency of the “departmental” system is to cramp progress, and, to that extent, to prevent the effective working of the unit. It is dependent on particular individuals, and expansion, consequently, can only be made by making difficult

¹ *Philosophy of Management*. Oliver Sheldon. Pitman, 1923.

changes. Autocracies are notoriously unable to perpetuate themselves. The autocrat may be benevolent, but it is inevitable that he should establish conditions and methods peculiar to himself, which, once he is removed from his throne, crumble to dust.

Following this thought, it is doubtful whether the "departmental" system really serves the other main aims of sound organizing. Does it enable work to be conducted in the most economical, effective, and expeditious way? In some respects, it does; for it permits of rapid decision, and effective co-ordination, since all the activities affecting the department are in the hands of one individual. Yet, there is the danger that, the department being a self-supporting and centrally controlled unit, the work within the department will be divided as best fits the whims and views of the manager rather than according to any scientifically devised plan. The outcome of this may well be ineffective and restricted working. Furthermore, however self-contained a department may be, it must always have relations with the other units in the organization, and, in so far as the working relations are ill-adjusted, owing to different systems in different departments, waste and inefficiency again arise. It is open to doubt also whether the "departmental" system achieves that further aim of good organizing, which is to provide conditions most conducive to effective human endeavour, and to evoke the fullest response from the human power available. Every despot is besieged by sycophants and place-seekers. Where government is dependent on the will of the individual, rather than on any scientific laws, justice is "ill-founded in the realm." Promotion becomes a matter of flattery; security becomes the reward of servility. However benevolent the despotism, conditions definitely thwarting the full and eager application of human energy arise. The "departmental" system to some extent involves these conditions and, even though, for the time being, the manager may wisely organize his department, there can be

no such continuity of policy regarding staff as is necessary to evoke their fullest contribution.

The "departmental" system, under a great leader and organizer, may achieve excellent results. It carries in its heart, however, the seeds of decay. It flourishes while its leader flourishes; when he dies or passes on, the ravages of its own weakness are rapid and devastating.

The "Staff-and-Line" Plan.

The "Staff-and-Line" form of organization is a midway house, so to speak, between the "departmental" system and the "functional" system. It embraces features of both. It is also "midway" in an historical sense, for the story of most progressive organizations is a story of evolution from the "departmental" idea to the "functional" idea. This form of organization is based upon a strict demarcation between thinking and doing, between the actual execution of work, which is the "line," and all the work of analysing, comparing, recording, and advising, which is the "staff." The Staff division is, in fact, advisory and supplementary to the Line division. It involves the segregation of those activities which are not part of the routine process of manufacturing and selling the goods, and placing them in the charge of officers who take no direct or executive share in carrying on those processes. The chief function of the Staff is to analyse and point out the road to business efficiency. The task of attaining the ideals pointed out is the function of the Line. The recognition of the fundamental distinction between thinking and doing is the distinguishing feature of this form of organization. It is a distinction which is basic, and no organization which fails to take it into account can claim to be effective. It is one of the great classifying factors between human beings. Some have the minds of men of action—leaders, managers, executives. Some have the minds of thinkers—scientists, planners, organizers, engineers. Some "want to get things done"—some think more

of the " Why " and the " How," and less of the doing. A sound organization must fit both types into its scheme, for both are necessary and complementary. The " Staff-and-Line " form of organization is founded upon this condition. To that extent it is wholly sound.

Under this form of organization, it is open to organize the Line as one will. Clearly, however, the Staff is of more value when the Line is organized on the " departmental " system. As has been seen, the manager, under the " departmental " system has many varied subjects to which his attention must be given. He cannot, therefore, under the pressure of growth, yield up time or find opportunity for investigational work and solid, constructive inquiry and thought. The Staff is, therefore, instituted to discharge this work, and to advise the Manager on his problems. It is the formal organization of the " expert " in industry. It will conduct technical research work into processes ; it will employ time-study and other methods of analysis ; it will keep detailed records and statistics to check actual times and outputs ; it will, after analysis, recommend certain standards for the Manager to adopt—standard times for processes, standard outputs per machine or per worker, standard costs to be worked to, standard methods of operation to be adopted. In a wider scheme of staff organization, the Staff will perform the same activities for selling and advertising—analysing markets and the suitability of goods for the market ; checking the results of the salesmen, maintaining statistics of sales, suggesting standards for the sales in various areas, and analysing the different media for advertising.

The " Staff " organization, therefore, it will be seen, normally comes into being as the result of the inability of the " Departmental " managers to investigate, think, and plan at the same time as they are performing the ordinary tasks of production and selling control. After all, most organization work is reorganizing, and the first step in reorganizing normally is taken because some pressure of

events—competition, falling sales, uneven quality, high costs, high labour turnover—compels it. The first urgent matter, under such circumstances, is to analyse conditions and causes; there are questions, and those questions demand answers. Why is the cost so high? Why is the quality not maintained at a standard level? Why are sales declining? Investigation becomes necessary; this takes time and requires a special technique and a specialized knowledge. Thus the nucleus of the "Staff" comes into being; the first step has been taken on a road that leads away from the "Departmental" idea.

The "Staff-and-Line" principle is not a complete theory of organization. It emphasizes one special and profound aspect. It does not specify how the Line or the Staff shall be organized, or how their activities shall, in detail, interlock. The Staff may be organized in a completely separate unit, under a Staff Manager, or the personnel of the Staff may be distributed in the Line departments. The essence of the principle is that the work of investigation, research, recording, standardizing, and advising—the work of the expert—should be wholly distinguished from the work of production or of distribution, and should be under a separate control.

VII

THE "FUNCTIONAL" PLAN

The "Functional" principle of organizing may best be described in the following terms: "By this plan, specific functions common to all or several departments . . . are each placed in the hands of a man specifically qualified for his particular function, and instead of giving attention to all the factors in *one* department, he gives his attention to *one* factor in all departments."¹ It will be seen that this scheme compels the disintegration of the units established

¹ *Managing for Maximum Production*, contributed to *Industrial Management*, April, 1919, by Mr. L. V. Estes.

under the Departmental system. Under the latter, the Manager bought his own materials and engaged his own labour; under the former, all buying is controlled by a Buying Department, and all labour is engaged by a Labour Department. The two principles are, therefore, to some extent mutually exclusive. Under the one, work is divided according to processes or products irrespective of functions, under the other it is divided according to functions, irrespective of processes or products. Historically, so to speak, "functionalization," to use a word which has been coined, is the natural outcome of the preliminary separation of functions advocated under the "staff-and-line" organization. The latter distinguishes research and allied work from executive work; the former carried this farther by distinguishing each function from every other.

Advantages of Functionalization.

The advantages which accrue from the adoption of this form of organization are many, though there are also undoubted difficulties in its operation. By placing each function under the care of an expert in each type of work, greater efficiency is bound to result. Buying must inevitably be keener and more effective when all the buying is under the control of one man, who concentrates solely on buying, than when it is conducted by several officers in several departments, who have many other duties to perform in addition to buying. Again, under functionalization there is no practical limit to the extent to which a business may expand. No matter whether the buyer is buying forty articles or four hundred articles, no matter whether he is buying in pounds or in tons, he is still exercising one faculty only, and has only one activity to control. As the business expands, the volume of work increases, but, in each function, one man is still controlling only one activity. There is, therefore, no "bursting-point," so to speak. Again, by allocating one set of duties to one individual, the presumption is that each man is working "on the line of

his strength." He is, therefore, the more likely to be happy and successful in his work, able to handle it with confidence, and bring to it the specialized knowledge he has acquired. Further, such a development of organization is inevitable, if all the practices of modern industrial management are to be satisfactorily carried out. A modern business is a spider's-web in complexity; like most other corporate enterprises, it has developed a thousand new activities, each requiring an increasing amount of technical skill and knowledge. Specialization ensues inevitably, and functionalization is specialization in a particular form.

Dangers of Functionalization.

The "Functional" principle of organization has its dangers. Carried out to its extreme limits, it will be found to make confusion worse confounded. It is inevitably the most difficult form of organization to apply, for it is designed to cope with conditions of industrial management which are themselves daily increasing in diversity and intricacy. Industrialists crave for a simple organization, much as people sigh for the "good old times." They are baying the moon, for modern conditions in industry have passed beyond the stage where simple organizations are possible. Functionalization is a simple principle, but its application to modern industry is far from simple, and the manager who wishes to forge ahead with reorganization on functional lines will do well to temper his zeal, and be prepared to run slowly and to make adjustments. Reorganization on this scale needs to be precluded by a long period of cultivation of "the organization sense," for functionalization applied to modern industry can only work with completely effective results when all responsible officers, and especially the highest officers, are fully imbued with the sense of what one may call "job relativity." The complexity of a modern functionalized organization engenders impatience and a tendency to "kick over the traces" on the part of those who compose the organization.

Restrictions and delays arise, often enough explained by impolite reference to that convenient generality christened "red tape." Such criticisms of functionalization are, at bottom, either railings against the complications of modern industrial conditions in general, or are due to provision not having been made against the dangers which undoubtedly arise in functionalization.

There are, I believe, three main dangers in functionalization—firstly, the danger that there may be a lack, from top to bottom, of co-ordination ; secondly, the danger that there may be a lack of definite responsibility for results ; thirdly, the danger that the maximum use may not be made of the abilities of the staff.

Co-ordination in a Functional Organization.

As I have pointed out above, co-ordination is one of the major problems of modern industrial management, and it becomes immensely acute in a functionalized organization. It can readily be understood that where each main unit in the organization is carrying out one function—buying, selling, research, labour, accountancy—it becomes vitally necessary to ensure, firstly, that the net outcome of these various activities is the manufacture and sale of the best article at the right price at a proper cost ; and, secondly, that machinery is provided so that each function interacts closely with other functions—the buyer with the department using the bought materials, the labour officer with the department for which he is engaging labour, the advertising department with the manufacturing department whose goods are being advertised, the cost accountant with the department whose processes are being costed. "Just in so far as functionalization brings the necessary and effective decentralization for action, so does functionalization of itself make essential another function. Where there are separate entities of an organization, each responsible for action and results in its own line, and all aiming at the same ultimate object, it is necessary, in order to obtain

harmonious and effective ultimate action, to recognize the necessity for co-ordination and to treat it as a distinct and basic function of the organization.”¹

Co-ordination at the head of the organization has already been discussed. The brief view of functionalization that I have been able to give will indicate the indispensability of such top control. The co-ordination of all functional activities is distinct from co-ordination between functions. It is, therefore, imperative that the head of the organization should aim to bind all the functions together and enable them, in a body, to strive unitedly towards the one common end. A clear, concise, definite and comprehensive statement of that end is the first necessity ; secondly, there must be one individual—a Managing Director or General Manager—to interpret policy, to control interworking between the various functions, and to watch and direct results. This co-ordinating machinery must, further, be continued down through the various links of the organization. At various points in an organization there must be centres of co-ordination, strategically located to provide the maximum of efficient interworking with the minimum of interference in the flow of work. On the factory side, these centres are the positions held by what are generally referred to as “ departmental managers ” or “ foremen.” Their primary duty, under a functionalized scheme, is to co-ordinate all the functional activities in relation to the particular processes under their care—the buying for these processes, the statistics, the costs, the planning, the design, the equipment. It is their duty to focus these activities, to bring them into common line, so that the net result is the highest degree of efficiency. To harness these functions for the purpose of production, whilst at the same time leaving each free to apply its own technique is the problem for the organizer. The most practical course is to regard each function concerned as consisting, firstly, of a “ headquarters ” portion ;

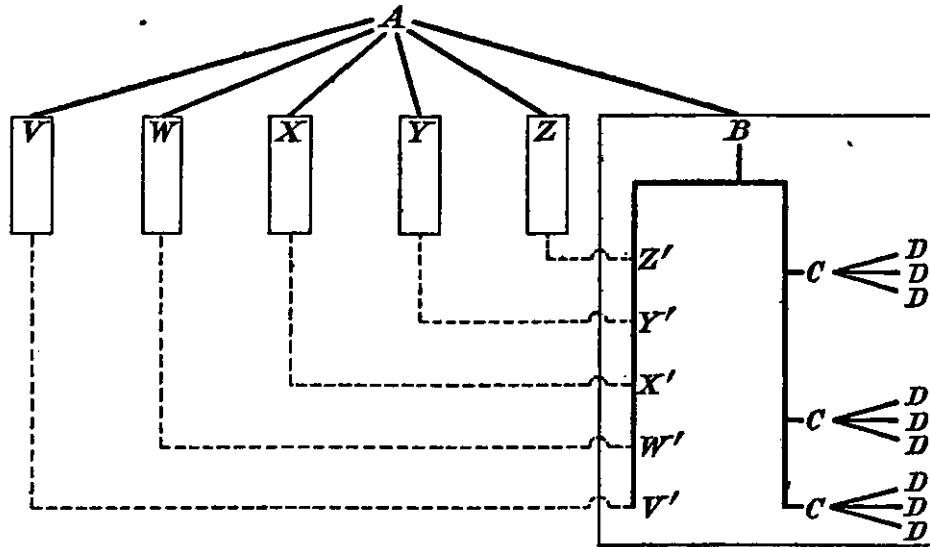
¹ *Taylor Soc. Bulletin*, Vol. IV, No. 2, April, 1919. Mr. R. A. Feiss.

and, secondly, of a "departmental" portion, the staff of the latter being located actually in the operative department concerned, reporting to the departmental head for discipline and results, and to the functional head for questions of technique and method. This arrangement, illustrated in the accompanying diagram, facilitates full co-ordination without interfering with the technical procedure of each function.

It will be seen that, under this arrangement, the Manager (B) occupies the position, as it were, of employer of the functions V, W, X, Y, Z, each of which sends its representative to work for him; and whilst each function retains the right to carry out the work in its own way, the result must be such as will satisfy the manager's requirements. It is then the manager's duty to co-ordinate the activities of these functions which are contributing to the efficiency of his department, so that the sum of their joint work is a smoothly and effectively working department.

Use and Abuse of Committees.

To ensure close interworking, it may further be necessary to set up committees, composed of representatives of the functions whose work requires constant co-ordination. It is desirable, however, to approach with caution this means of interlocking. Committees are expensive in time; they tend to sap individual responsibility; they often involve delays, and are apt to obscure issues and to arrange compromises where clear-cut decisions are necessary. To effect co-ordination does not mean in every case that a committee must be established. Committees should be a last resource rather than a first thought. If they seem the only alternative, it behoves one to consider whether the need does not arise from a shortage of common co-operation, from faults in the planning of the organization, or from lack of standard procedures. All of these are fertilizers of the "committee habit." In certain instances, however, committees are desirable and useful, where debatable points



————— *Line of Control for Results* - - - - - *Line of Control for Methods*

- A = Higher Co-ordination
- V W X Y Z = Functional "Headquarter" Units
- B = Manufacturing Department Manager
- V' W' X' Y' Z' = Functional representatives in Manufacturing Departments
- C = Foremen in charge of processes
- D = Operatives

of policy, affecting more than one function, arise. Such committees need to be strictly limited in scope, and should be regarded as advisory to the function called upon to take action on the issues laid before the committee.

Much of the need for the discussion which arises on committees can be eliminated by the determination and publication of standard procedures for the execution of various types of work. Such procedures are essential in all large organizations, since in carrying out one activity—say, the engagement and putting to work of a new employee—possibly four or five departments may be involved. To ensure that each department performs its own part of the process, it is necessary for all concerned to determine upon an agreed method of working. This agreed method should be put into writing and published, so that all concerned may know what exactly are the steps being taken. Such procedures, moreover, constitute an effective means of control for the manager.

The Measure of Results.

By these various means, the danger of lack of co-ordination in a functionalized organization can be overcome, given of course, that common measure of goodwill and co-operation without which no organization can operate effectively. Beside this danger—a very real and ruthless one—the other pitfalls of functionalization are comparatively innocuous. Under the “departmental” plan, where responsibility is complete for everything concerning a department, the results are, of course, the measure of the efficiency of the department. The profit on the department is the outcome of the efforts of the department, and is a satisfactory measure of those efforts. Under the functional scheme of organization, this cannot obtain so completely. The price of the materials used by the department rests in the hands of the buyer; the rates of wages depend on the judgment of the Labour Manager; the goods to be manufactured are prepared by a Design Department; the

amount to be produced rests with the Planning Department. Although the Manager of the manufacturing department co-ordinates these activities so vitally affecting his efficiency, he cannot, of course, under these circumstances, be held wholly responsible for the departmental profit. He is not, therefore, to be judged on the profit-and-loss account figures. It is, however, important to have some measure, both of the department and of each function, and, under functionalization, these measures must be devised. In a word, these measures are "standards." The primary "standard" is the Budget—a carefully prepared and detailed statement of planned sales, costs, and expenses for the forthcoming year or half-year. This Budget will plan for a certain profit on the business as a whole, and should allocate to each unit in the organization the amount it can expend. It then becomes the duty of each responsible head to keep within his budgeted figure, and the burden is laid on the chief executive of ensuring that such figures are maintained, knowing that, if they be maintained, a certain profit must result. Other standards are necessary in order that the budget for the whole business may be compiled—the plan of sales, the standard output per operation and per worker, the standard of quality, the standard methods of operating each process. Such standards can only be fixed after most careful analysis. As fixed, they constitute the criterion which those concerned are expected to achieve.

Maximum Use of Staff.

The further danger of functionalization—that the maximum may not be made of the abilities of the staff—is one of those hidden weaknesses which often fail to betray themselves. It is common to all forms of specialization. An individual, having pre-eminently the qualifications of a buyer, is placed in charge of or in the Buying Department. In that capacity, he performs nothing beyond buying work, and, although he may be an admirable buyer or buying clerk, the chance does not arise, in his work, to display his

other abilities. He may perchance have originality, taste, and even experience which would fit him for advertising work—but the chance never comes ; that amount of human power is being wasted. The danger is less apparent than real. Most men are happy enough when they are doing what they know they can best do. Their other capabilities do not, under such circumstances, clamour for expression. Yet this power should be harnessed for the benefit of the business. The method of harnessing it does not lie within the scope of this chapter ; it is a problem which must be met, and can be met, by those who frame and apply the policy of the business as regards the treatment of its staff, and the facilities it affords for changes in employment, for promotion, for conferences, and for the putting forward of ideas, criticisms, and suggestions.

Although functionalization has its dangers and brings difficulties of no mean order, it is the only form of organization which is capable of meeting adequately the circumstances of modern industry. There seems to be no end to the complexities introduced into modern management—complexities rendered necessary by the exigencies of modern trading. The brief survey we have been able to make might, however, suggest that such a form of organization is only necessary for large corporations. Every small organization is, however, a large organization in embryo. Growth is a condition of existence. The small concern, therefore, will be well-advised to begin with the form of organization with which it intends to operate as it grows. It should bear in mind, too, that growth will be easier where the organization is planned to allow for growth. Drastic reorganization—the inevitable consequence of organization not being planned for the future when businesses are smaller—brings loads of difficulty, and can only be avoided by the adoption, in the early days, of a form of organization which puts no brake on expansion and can develop itself without difficulty as the expansion proceeds. The small functionalized organization will, of course, have the same

number of functions as the large organization. It will not be necessary, however, to fill each position with a different officer; one man may perform several groups of duties. The essence of functionalization is to distinguish between jobs. Where one man holds two positions, however, it is important to distinguish between his two jobs, so that, as expansion compels him to divest himself of some portion of his work, he may hand over to a colleague or subordinate a complete and scientifically-determined job—not a miscellany of such duties as he himself does not particularly relish.

VIII

THE FUNCTIONS OF INDUSTRY

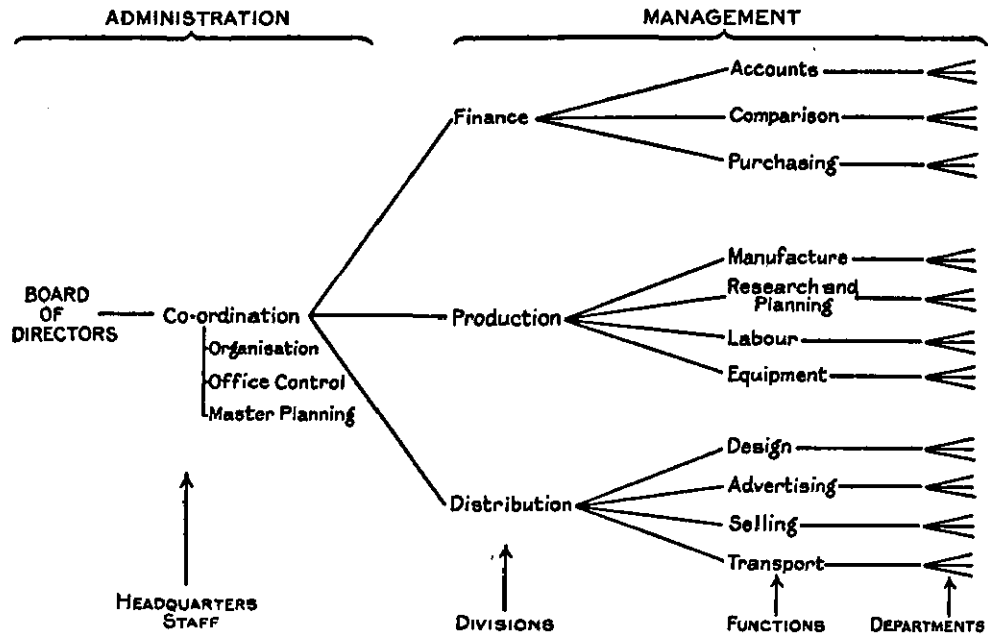
It will be proper, now, to ask what are these "functions"? How does one determine what shall be the "functions" of a functionalized organization? These are among the most difficult questions which an organizer has to answer. I believe, in time, that scientific analysis will make it possible to define the functions which are essential and applicable to every industrial concern. That stage has not yet been reached; a vast amount of research work is necessary before it can be reached. In the meantime, one can but suggest what one believes, with our present knowledge, to be the best grouping of work into functions. Our task is to divide the whole operations of a manufacturing and selling concern into scientific sections, in such a way that related and similar activities, demanding the exercise of similar human capacities, are grouped together, like with like. Each function must form a compact group of intimately associated activities; each function must be clearly distinguishable from other functions, and, in so far as its technique is concerned, the functions must, as far as possible, be mutually exclusive; and, further, each function must be capable of control by a single individual. Bearing these conditions in mind, it is suggested that the activities

of a business are, in the first instance, divisible into three main parts, which we may call Divisions. These Divisions are Finance, Production, and Distribution. (It should be noted, of course, that these are subject to the over-ruling control of Co-ordination.) Each of these Divisions is divisible into Functions, as shown in the accompanying diagram.

This grouping is not a proven proposition. Doubts on the subject can only be resolved by wider and wider research into the activities of modern business practice. Experience in organizing is not the first necessity for the determination of an ideal scheme, for nearly every organization, consciously or unconsciously, is modelled, to some extent, on the qualifications of the available staff. The only way is to analyse in every detail the work of the particular concern being organized, and then by a process of piecing together, job by job, to plan the completed structure. This is the course which every wise organizer should pursue, and, in our present state of knowledge, only the bitter fruits of disappointment will come to the hands of him who attempts to apply any ready-made scheme to his own peculiar conditions. With this proviso, we may now very briefly examine the scope of each of the suggested functions in the diagram.

The Finance Division.

The Finance Division is composed of the functions of Accounts, Comparison, and Purchasing. The Accounts function is almost sufficiently described by its title. It is the function responsible for the keeping of the Company's books, the control and recording of the cash incomings and outgoings of the Company, and attendance to such matters as rating, taxation, insurance, and investments. It is primarily a recording function. It does not take any part in the purchases or sales, as a result of which cash transactions and records ensue. It is responsible simply that, when such purchases or sales are made, the proper



payments or receipts take place and accurate records are kept.

4. The Comparison function is the function responsible for the maintenance of all records and statistics, other than the financial accounts of the Company. No figures are of value of themselves ; they are only valuable to the extent that they are compared with other figures ; hence, the name suggested for this function. The function is responsible for costing ; statistics of sales, wages, output, etc., and for all compilation work ; it is further responsible for presenting its data in a way which will indicate the conclusions to be drawn.

The Purchasing function is responsible for all buying and material storage—the buying of materials of all kinds, from steel, flour, pig-iron, or leather, to boxes, pencils, notepaper, or advertisements ; the storage of all these items, also. It is responsible, therefore, for storekeeping methods.

The Production Division.

Under the Production Division, the Manufacture function is responsible for the control and execution of the processes of manufacture and the control of the workers at their work. It is, therefore, responsible for the maintenance of the maximum manufacturing efficiency and for applying each auxiliary function to that end, and co-ordinating such assistance. The Labour function is responsible for the selection, transfer, and discharge of factory labour, the fixing of wage rates, and the supervision of factory conditions to ensure that they promote the health and efficiency of the workers. The Equipment function is responsible for the provision of the necessary plant, tools, machines, and buildings, and for their erection and maintenance. The Research and Planning function is responsible for technical research work into processes, lay-out and methods of operation, the fixing of standard methods, times, and outputs, and for planning the amount to be produced per unit, in a given time.

The Distribution Division.

Under the Distribution Division, the Selling function is of course, responsible for the actual selling of the finished products to the company's customers. It controls travellers and agents, at home and, maybe, abroad ; it deals with all correspondence with customers, and conducts the clerical work in connection with customers' accounts. The Advertising function is similarly clearly described in its title. It is responsible for conducting all means of publicity—press advertising, poster or display advertising, and the numerous other media for bringing the goods of the company to the notice of those who would be likely to buy them. The Transport function, as its name suggests, is responsible for conveying the goods of the company to wherever they be required by whatever means are most economical and expeditious. It controls the stores of the company's finished goods, and packs them for transport. The Design function is responsible for the design of the company's products, to ensure that they meet the requirements of customers. To this end, it will conduct the necessary investigations into market requirements, into the goods supplied by competitors, and into the reasons for the sale or lack of sale of the company's own products. This function may, in some businesses, be more suitably located in the Production Division, the deciding factor being whether the goods are sold widely to the general public, in which case it is better located under Distribution, or whether they be sold to suit particular customers, in which case it may be better located under Production.

Headquarters Organization.

In addition to these functions, it will be seen on the diagram that certain special activities are indicated under the heading of Co-ordination. These are, so to speak, specialized co-ordinating activities—the machinery by which the company's activities are kept smoothly working. Firstly, there is the control of the organization, involving

the work which is described in these pages—the planning of the various positions in the organization, the preparation and issue of general instructions as to procedure, the allocation of particular jobs to particular officers, and the taking of such measures in the organization as will facilitate the execution of managerial work and the well-being of those who perform it. In addition, this section of the “headquarters” of the organization will be responsible for the training of executive officers and for their promotion and transfer, as directed by the Managing Director. It is responsible, in fact, for planning not only the distribution of duties, but also the allocation of individuals to perform those duties. Secondly, there is the co-ordination of clerical work throughout the concern. This involves the provision for each function of adequate and suitable clerical workers and equipment, the supervision of clerical work, wherever it is performed, to ensure that the methods adopted are efficient, and the planning of the conditions which will ensure and preserve the health and mental satisfaction of the staff. Thirdly, there is the co-ordination of the activities of the Company by the provision of master plans and budgets, to which brief reference has already been made. This involves the co-ordination of all plans and programmes prepared by the various functions—sales plans, selling campaign programmes, advertising plans and budgets, production plans, etc.—to ensure that each dovetails in with the other. It involves the preparation of a covering or “master” plan, incorporating the functional plans, which constitutes the scheme of operations for the business as a whole. On the basis of this plan, the budget of income, expenditure and profit can be compiled. As approved, these plans and budgets form an aim which all responsible officers are concerned to achieve, an instruction to which all must adhere, and a measure of progress for those who direct the concern as a whole.

Such, in very tenuous outline, are the activities of the average industrial concern, divided into various units of

control, called Functions. It is, of course, impossible in this short space to consider the details, and it may be that so cursory a survey may leave many points blank. It will be enough, however, if the reader has grasped the basic idea of functionalization, for it lies at the root of sound organizing, not only in industry, but in every corporate enterprise.

IX

THE PROBLEM OF DELEGATION

It will be clear, however, to the reader, particularly to one who visualizes these proposals in the form of an organization chart, that, though we may have analysed the activities of a concern and have suggested the functions which shall form the main structure of its organization, we have by no means completed the task of organizing the business. We have, so to speak, divided the work horizontally, but in a concern of any size, it is certain that no one man can perform all these tasks, nor single-handed perform the duties even of one function. This brings us to the question of delegation. Already we have presumed in our discussion that a Managing Director has delegated responsibility for various branches of the work, and that those directly responsible to him have in turn delegated responsibility to the heads of the various Functions. In a large organization, there must be further stages in the process of delegation, right down the line to the office-boy or the worker. What are the principles behind this? What are the various degrees of delegation to be determined, and what are these degrees?

Delegation is, so to speak, the vertical divisioning of work—the division of a total sum of work into various component and subsidiary units of responsibility, each unit carrying a less degree of responsibility than the whole of which it forms a part. There are, therefore, varying degrees of responsibility according to whether the responsibility of a position is for the whole of the work of the

organization, as in the case of a Managing Director, or for some part of it—a major part, as in the case of, say, a Divisional Manager, or a minor part, as in the case, say, of a chargeman responsible for one small group of workers. This vertical dividing of work is necessary because, clearly, there is a limit to what one man can do. The officer in charge, for example, of the Selling Function, cannot both manage the function and, at the same time, do the actual selling, deal with the accounts, call on the customers, collect the cash, send in statements, etc. He must delegate the responsibility he carries to men working under his supervision, allotting to each some definite group of duties, usually referred to as a "job." These, in turn, may require to delegate work to others, and so on. Having delegated the work, the officer no longer performs the duties involved; he supervises others. We find, therefore, firstly, that there are several grades of jobs in an organization, according to the responsibility carried; and, secondly, that each grade represents a corresponding degree of supervision. The Sales Manager may delegate responsibility for English selling to an English Sales Superintendent, for Scotch selling to a Scotch Sales Superintendent, and for Export selling to an Export Sales Superintendent. We may imagine that each of these has, say, twenty salesmen under his supervision. Each accordingly appoints one man to supervise the work of ten men, and another man to supervise the work of the other ten. The Sales Manager, the Sales Superintendents, and the Sales sectional heads are all engaged in selling, but are performing different grades of jobs, at different levels, so to speak, of responsibility, each level being determined by the amount of responsibility carried. All are exercising supervision, but in different degrees, corresponding to their jobs, and indicated in the titles of their jobs. The Sales Manager, in supervising the Sales Superintendents, is clearly exercising a higher degree of supervision than the Sales sectional head who is supervising ten salesmen. It is a higher degree

of supervision because his job is at a higher level of responsibility, which is equivalent to saying that he is responsible for a broader span of the work of the organization.

Degrees of Supervision.

I have earlier expressed the belief that ultimately it may be possible to determine upon standard "functions" applicable to any industrial undertaking; equally, I believe that it may be possible to determine upon standard degrees of supervision. That time, however, is not yet, and here one can only suggest what those degrees should be. In the accompanying statement there is suggested a scheme showing (a) the degrees of supervision, (b) the units of an organization corresponding to those degrees, and (c) the suggested title of the officer in charge of such units.

TITLE	DEGREE OF SUPERVISION	ORGANIZATION UNIT
A Director	exercises Direction	over a Company.
A Managing Director or General Manager	„ Co-ordination	„ an Organization.
A Divisional Manager	„ Executive Direction	„ a Division.
A Functional Manager	„ Control	„ a Function.
A Departmental Manager	„ Departmental Management	„ a Department.
A Superintendent	„ Superintendence	„ a Section.
A Supervisor or Foreman	„ Supervision	„ a Sub-section.
An Overlooker or Junior Foreman	„ Oversight	„ a Group.

Grading of Jobs.

It will be readily understood, of course, that, though the various degrees of supervision correspond to various levels of responsibility, responsibility is in itself an indefinite term. In even small organizations, there are certain to be a few officers who carry considerable responsibility, yet

are not, say, Departmental Managers or Superintendents. Responsibility may vary in degree from many causes—the degree of technique involved in the job, the complexity of the job, its earning power for the company, the number of persons controlled, the number of important jobs that come under its authority, the number of major problems arising in the conduct of the work, the degree to which consultation with superiors becomes necessary. All these will have a bearing upon the relative importance of jobs. If, therefore, we wish to “grade” the various positions in any organization in order, perhaps, to regularize salaries, it will be necessary to analyse every job and classify them, according to some agreed system of marking, into grades, comparable jobs being graded together. As a result of such grading, a man who is not a Superintendent, in charge of a section—say, a technical chemist—may perhaps be graded as the equal of a Superintendent on account of some aspect of his work which loads him with a corresponding responsibility. Such an analysis and grading is absolutely essential if all questions of salary and precedence are to be satisfactorily settled, and if a logical scheme of promotion is to be established. It is the only scientific and, therefore, defensible way of ensuring justice in these contentious subjects, and, therefore, must play an important part in building up and preserving the goodwill and loyalty of the staff.

X

QUALITIES OF THE ORGANIZER

Reviewing our general examination of organization principles, it will be seen that we have briefly explored the two main aspects of an organization—the work to be done, and the faculties which are needed to do it ; or, to use the jargon of organization, the functions of business management and the degrees of supervision exercised in their

execution. The two together constitute the framework of any organization. We come back to our original starting-point—that an organization consists of work to be done and people to do it. The happy blending of the two, the close and scientific linking together of the work and the faculties employed in performing the work—these are the aims of sound organization.

The work of organizing demands, therefore, a rare compound of qualities. It requires a high standard of analytical ability—the ability which always drives to the detail of work, and sets out its elements like the wings of a butterfly. It requires the constructive mind—the mind which, having analysed the detail, can re-arrange it into a finished and balanced structure. It requires what one may call the “long distance” mind, which, even in the midst of the myriad details of an organization, can yet see, clearly and steadily, the object for which the building is being erected. It requires a fine sense of proportion, so that what is sound is not rendered unsound by over-elaboration. It requires the mind fully appreciative of the needs of the human factor, so that the organization may be built to allow for those needs.

Organizing begins with jobs and work and methods, but it ends, as all business activity ends, with human beings. The ultimate end of all organization work is that the persons who compose the organization should be able to work effectively, and economically, in an atmosphere of justice, co-operation and contentment. Generous-hearted leadership can achieve much; broad welfare work can achieve much; but neither can outbalance the sinister effects of poor organization. Where the distribution of work occasions friction, jealousy, and bickering, where the dividing of units leaves positions unequally graded, where the work done is so obscured that merit goes unrecognized, where promotion and salaries depend upon arbitrary decisions, not related to any recognized system—these are the conditions which depress the *moral* of the staff.

They constitute an insidious canker, corrupting the whole body, which no stern discipline, no enthusiastic leadership, and no generous schemes of amelioration can dispel. To organize soundly is to carry out the truest form of welfare work, for its aim is to remove the causes, not tend the sores, of human dissatisfactions, and, in their place, it makes possible the growth of those treasures of human achievement—the justice which, scientifically founded, fears no question, and the co-operation which welds the many into the one.

SUMMARY

1. An organization exists when persons join together to further a given project. Organization becomes more pressing with growth. Modern conditions compel a study of organization. We may learn from older organizations. Organization is a developing science.

2. *Definition of Organization.* Certain essentials stand out—

- (a) Organization is a process.
- (b) Organization is the determination of duties.
- (c) Organization is only a means to an end.
- (d) Organization must ensure co-ordination.
- (e) Organization depends on persons as well as jobs.
- (f) Organization presumes that certain means are available.

3. When is organization good? When it achieves certain ends—

- (a) To enable work to be done easily and efficiently.
- (b) To ensure effective central control.
- (c) To ensure easy expansion, despite changes.
- (d) To make full use of available human power.

4. Organization depends on the objective. Need for business policy. Definition of policy. Discussion of policy-making. Administration defines policy; Management carries it out.

5. Duties of Administration. Duties of Directors. Duties and position of a Managing Director or General Manager. The mechanism of co-ordination—co-ordination of the organization, of results (by budgets), of the time-factor (by time-tables).

6. The sphere of Management. Who compose it. What, under modern conditions, must Management carry out? Some features of "modern conditions." List of jobs. Principles on which to group them—

- (a) Departmental system, explanation.
- (b) Staff and Line, explanation.

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7. The Functional Principle—Dangers of, Advantages of, Need for co-ordination. Chart showing relationship of functions and Production.

8. What are the functions? List and Description.

9. Delegation. Definition of. Degrees of supervision. Chart.

10. Qualities of an organizer. Effect of sound organization on well-being of staff.

CHAPTER III

THE ORGANIZATION OF PRODUCTION

By J. W. WARDROPPER

I

THE FACTORS IN PRODUCTION

THE fundamental purpose of a factory is to take materials, raw or unfinished, and by passing them through a series of processes or operations, utilizing certain kinds of equipment, to make a change in or on the materials, and thereby turn out a finished saleable article. The material is changed either in shape, form, or nature, and the product may be the result of a chemical process, a series of machining operations, or an assemblage of different kinds of material into some completed article. The organization of a factory for production requires that goods of a standard quality shall be produced at a commercial cost, which in turn necessitates production at the maximum speed possible with the minimum investment of capital in materials, buildings, plant, and stock. In short, the successful management of a factory results in the largest quantity of output of the standard quality in the shortest time, at the cheapest cost per unit. The four main factors involved under the general heading of Production are concerned with the economical use of materials, machinery, men, and methods.

The Use of Materials.

In connection with materials, the organizer of production has to make provision for their selection, safe custody, and efficient and economical transportation and manipulation in the factory. In some industries the physical and chemical properties of the materials used in manufacture have been carefully determined by competent authorities, and embodied in purchase specifications. Where these standard specifications are recognized by trade associations,

produce markets, or scientific associations, the purchase of materials is a fairly routine matter, because the supplier and purchaser are then able to talk in common terms, and the purchaser is fairly certain to get the class of goods for which he is paying. In other industries the growing complexity of the market system of grading materials, and the multiplicity of private brands, tend to make the work of purchasing a fine art, but whatever the size and character of the business, and no matter what the nature of the product may be, an essential branch of the production organization is the Purchasing Department. Closely linked with this department is the system of stores for the control of the receiving, storage, and issuing of the materials purchased. The layout of the plant and the nature of the processes carried on will largely determine the question of internal transportation of the materials in the factory.

The Maintenance of Machines.

In established businesses the questions of selection of the site, the character and arrangement of the buildings, the disposition of the processes and machines are already settled, but the maintenance of the buildings and machines in good repair is an important branch of the work of production. When extension or reorganization of processes is found necessary, the general arrangement of the plant and the effects of this arrangement upon economy of production will need to be studied with a view to the elimination of inefficiency.

The Control of Labour.

Labour is the one responsive element in manufacturing, and the management of every business must learn the art of directing the working force under its control to the most desirable total effect. In a lecture on "The Labour Controversy Dissected," Sir Lynden Macassey summed up the results of his experience as follows: "I am convinced, as the result of a long and varied experience, that the bulk

of employers and managers in this country have never grasped or accepted the fact that the sympathetic handling of labour is one of the most essential contributions they can make to the well-being of industry. The notion in the past has been that any man who had technical knowledge and ability could always handle human beings. It is a huge mistake. Only considerate and sympathetic treatment in the works brings home to the average worker the fact that industry recognizes his human personality. His consciousness of himself as an integral part of industry comes directly and specifically from the attitude and behaviour of those who are in everyday contact with him in the works." The care with which workers are engaged, trained, and placed in their jobs, the thought that is devoted to the improvement of the conditions under which they work, the methods by which their activities are controlled on the floor of the workshop, are important factors for the works or production manager, and will demand a large proportion of his time and attention.

Principles of Organization for Production.

(1) PLANNING AND FORETHOUGHT

The nature of the product largely determines the technical character of the processes and the methods employed in manufacture in any particular factory, but certain fundamental principles of organization for production applicable to all businesses can be noted. In the first place, all well-organized businesses are characterized by the exercise of plan and forethought in every detail of their operations. Supplies of raw materials, shop supplies, and tools must be adequate and on hand before production is started upon in the factory. Work is assigned to the appropriate machines for each operation, and the volume of work is regulated to provide that each machine and every operative in the factory have just sufficient work assigned ahead, so that a steady flow of work through each department is assured. Constant following up of the work during

its progress through the departments ensures that deliveries of finished stock will be made according to the pre-arranged schedule. Often a visual record of the progress of the work in the form of a planning and control board will facilitate knowledge of work in progress, and inform the manager whether the work is being carried out "according to plan." Where this principle of pre-determination is employed executive officers are set free from routine-planning work.

(2) THE USE OF STANDARDS

The second principle to be noted is that to an increasing extent businesses are being conducted by standards obtained through systematic research, experience, or reasoning. The determination of what constitutes a fair day's work to be used as the basis of wage payment has ceased to be a matter of the private judgment of the foreman or shop superintendent. By means of the measurement of standard rates of output under specified conditions, based on time study or records of past performance, facts are being substituted for opinions. The adoption of the technique of time and motion study enables the factory manager of to-day to make a searching scientific analysis of the best method of doing each job and the time necessary for its accomplishment, so that the worker of average ability can maintain under the conditions stipulated, that pace of work indefinitely, year after year, without physical injury. Quality of product is maintained by combining with judgment the idea of measurement of the desired qualities of dimension, purity, colour, form or finish, which determine the commercial value of the product. These examples illustrate the possibility of reducing the productive processes to standards of practice which will result in more economical methods of carrying on the work of a factory.

The Activities in Production.

This brief outline of the activities combined under the heading of Production will indicate that in organizing a

factory the works manager will need to make provision for the following activities—

- (a) Purchasing.
- (b) Stores.
- (c) Internal transport.
- (d) Maintenance of buildings and plant.
- (e) Employment—for the engaging, training, transfer, promotion and dismissal of workers.
- (f) Supervision.
- (g) Factory planning.
- (h) Time study and rate setting.
- (i) Inspection.
- (j) Administrative records.
- (k) Research.

In a small business the whole of these activities may be under the direct personal control of the works manager, but as the business increases in size he will probably find it necessary and desirable to delegate the control of these activities to special officials, and set up special departments to deal with these branches of the work.

In concluding the preliminary survey of the principles of efficient production, it must be emphasized that while principles are universal, the means by which these principles are applied must vary with each particular case. The first and greatest essential to success is an intelligent survey of the conditions, followed by the application of scientific knowledge, intelligent methods and plain, practical common sense to the provision of the means for meeting them.

II

RELATIVE IMPORTANCE OF THE FOUR FACTORS IN PRODUCTION

In its simplest elements a manufacturing process consists of performing certain processes or operations on given materials with the aid of equipment and men. The relative importance of these four factors—men, materials, machines, and methods—varies with the country in which

the work is carried on, with the nature of the industry, and within any given plant with the type of operation carried out.

Comparison between Great Britain and U.S.A.

This fact is demonstrated by a comparison between the industry of the United States and that of Great Britain. The United States is a land of vast natural resources. In 1924 she provided 72·7 per cent of the world's supplies of crude petroleum ; 47·9 per cent of the pig-iron ; 51·4 per cent of the steel ingots and castings ; 54·5 per cent of the copper ; 30·2 per cent of the silver. Her production of wheat was 28·2 per cent, and of oats 42·9 per cent of the world's production. She claims 83·9 per cent of the motor vehicles registered as passenger cars, and 75 per cent of the commercial trucks. Her cotton, tobacco and timber resources are immense. The country is, as yet, relatively undeveloped, and there is a relative scarcity of skilled labour. In consequence, the main characteristic of American industry is its specialization in " quantitative production." This requires quantities of raw material, processed by expensive machinery operated by specialized workers whose skill is derived from their ability to tend with energy and application the machinery and labour-saving devices that are a feature of the industry of their country. Great Britain, on the other hand, is a land of dwindling natural resources, dependent in a large measure upon her imports for the basic raw materials of her industry. The country is well developed in roads, railways, and docks, and there is little scope for the wide development of schemes which require the manufacture of quantities of " capital " goods. Her workers are in the main highly skilled craftsmen. The characteristic quality of British production is " qualitative production," that is, the production of goods which require a relatively small amount of raw material, and a large amount of skilled labour.

When a comparison is made between industries in the same country, one is again struck by the difference in the

importance of the four fundamental factors. One may search in vain for statistics relating to the cost of materials, wages, amount of capital for separate industries in Great Britain, but the following facts derived from the Abstract of the Census of Manufactures will illustrate American conditions. Taking the 1919 Census returns for the whole of U.S. industry, we find that the cost of labour was 16.9 per cent, the cost of materials 59.9 per cent, and the capital employed was 71.2 per cent of the total value of production. The following abbreviated table will show the wide variation between industries—

	Value of Products	Cost of Materials	Wages	Capital
All industries	100	59.9	16.9	71.2
Food and kindred industries	100	81.3	5.8	37.1
Stone, clay and glass products	100	37.6	30.3	116.3
Liquors and beverages	100	36.9	10.9	129.4
Chemicals and allied products	100	66.8	8.8	100.1
Iron and steel and their products	100	51.2	23.3	92.6
Railroad repair shops	100	40.4	53.7	57.4
Vehicles for land transportation	100	61.5	17.0	59.7

The striking contrast between the figures relating to food and kindred products and those referring to the extractive industry of stone, clay, and glass products will demonstrate the wide difference between the importance of the cost of materials and wages, and the amount of capital employed in plant and buildings in the different industries.

Importance of these Four Factors in an Engineering Establishment.

In order to see more clearly how the importance of the four basic factors may vary within the different sections of a factory, and how, therefore, the nature of the control of production will vary, let us imagine that we are making

a hasty tour through an engineering establishment, and that we start in the design department and drawing office. Here the shape, size, and specification of the product are determined, and detailed drawings prepared of every part, before the production order is given to the factory. In the pattern shop the drawings are received, and models of the castings are made in wood, so that the moulder can have a shape to which he can construct the mould in which to run the casting. Pattern-making is a highly-skilled craft, and intelligent workers are required to read the drawings or blue prints, and interpret them correctly. Knowledge of the technique of the subsequent operation of moulding is also essential. Every pattern is an individual product, not likely to be repeated, so that the work is, as a rule, turned over to a single workman to complete in a given time, or after the other work on hand is finished. The planning of the operations to be performed, and the decision as to nature and sequence of the operations, are determined by the man as he proceeds with the job. The equipment used in a pattern shop is relatively simple, and usually consists of power-driven devices to speed up the work of shaping the wood to the necessary shape. In the pattern-making department the importance of the man factor dwarfs that of the other three.

In the foundry, the conditions resemble those in the pattern shop to a certain extent. At this stage, however, unskilled labour can be used to a much greater degree and material-handling devices can be installed with advantage to deal with the heavier materials used. The process consists, briefly, of inserting the pattern into a moulding flask and then tightly ramming prepared sand round it. After the sand is fixed in the shape of the pattern, this latter is withdrawn, and the sand surface is sleeked and finished to prevent the sand from caving in, when the molten metal is poured into it. If the casting is to be hollow, the mould must be fitted with a core, which will be the size and shape of the hole desired in the casting.

The cores are made apart from the moulds, but by a similar process, and then dried in ovens. The two halves of the moulding flask are then bolted together ready for the casting operation. This consists of pouring the molten metal into "gates" or openings reserved for its reception at various parts of the flask. After the metal has cooled, the sand is broken away from around the casting, and the adhering portions of sand are chipped off by pneumatic hammers in the hands of unskilled workers. In many cases the casting is a special job not likely to be repeated, and much skill on the part of the moulder is required to ensure a product fit to go forward to the next process, for the presence of blowholes through careless work will cause spoilage of the casting. There is a great deal of labouring work in a foundry, and when the castings are small and repeat orders likely, a lower grade of labour can be employed. Where the nature of the work involves repetition work, it may be advisable to design special equipment to carry out the work of moulding by mechanical means. The governing factor in regard to the provision of special equipment will be the relation between the cost of providing it and the value of the time saved by its use. Thus we see that in a foundry the problems of control differ from those to be found in the pattern shop, since the factors of equipment and material have increased in importance compared with the labour factor.

When the finished castings leave the foundry for the machine shops they are larger than the drawing requires for the finished parts, hence they have to be cut, smoothed, and fitted to each other until they make as perfect a fit in the finished product as the nature of the final product demands. Let us take an actual example—the machining of a motor-car cylinder block. Such a casting will require machining on the sides to provide seatings for the induction pipe, and for a cover plate that encloses the valve tappet mechanism. At the forward end there will be a machined seating to take the cover plate for the camshaft drive

chamber, and at the rear end there will be a semi-circular seating that is connected to the forward end of the gear-box. The top of the casting will be machined to take the detachable head that contains the valves and the rocking levers. The cylinders will need to be roughly bored in a vertical direction, reamed and rolled, and the crankshaft bearings and also the camshaft and magneto drive shaft holes will require a boring operation in a horizontal direction. Numerous holes will have to be made in the top plane surface to take the bolts which will secure the cylinder head, and in the bottom plane surface for the bolts which will carry the detachable sump. To carry out these operations will necessitate the provision of equipment operated by skilled labour, and the methods used will need to be carefully thought out to ensure a finished job capable of fulfilling the requirements of the inspection department. The block will first of all be set up in a special fixture or jig, preparatory to being passed under the cutters of a planemilling machine. This machine will cut the cylinder head face to make a gas-tight and water-tight joint with a gasket. The casting is turned over and the milling operation is carried out on the bottom face. A radial drilling machine will then drill the bolt holes through the side lugs which will anchor the engine to the chassis. A four-spindle drilling machine will roughly bore out the cylinders, and then a multiple-spindle drilling machine will bore twenty holes at once in the positions decided upon for the holding bolts on the cylinder head face. Then a horizontal boring machine, the spindle of which will be fitted with an auxiliary three-spindle drill head, will be used to bore the crankshaft bearings and also the camshaft and magneto drive shaft holes. As regards the finishing to size, the holes, having previously been rough-bored to almost the correct size, only require reaming. The cylinders are finished off by rolling with hardened steel rollers, which has the effect of slightly compressing the metal in the cylinder walls and imparting a highly-burnished finish.

This rather detailed description of the process of machining a single casting has been given to illustrate the nature and relative importance of the four factors in production. The layout and maintenance of the machines, the balance between the number of machines used, the provision of carefully-designed tools, jigs and gauges, the method of selecting and training the workers, the rate at which they work, the design of the product itself, the quality of the material, its specification and condition, the planning and scheduling of the work through the various operations so that the setting-up time is kept to a minimum, the inspection of the work at various stages in the manufacture, and the organization of the work on the floor of the workshop, are the major problems of production.

III

FOREMANSHIP

A separate section of this book deals with the principles of labour administration, the selection and engagement of the worker, his training and placing in the job, and the establishment of wage systems which will provide the maximum financial incentive to induce him to put forth his full effort. A balanced view of the production problem is impossible, however, unless some consideration is given here to certain aspects of the labour question. On the floor of the workshop the ultimate responsibility for securing the required amount of output of standard quality at minimum cost rests upon the shoulders of the foreman.

The Foreman's Responsibility to the Management.

Standing next to the working force in the factory, the foreman occupies an important strategic position, for to the worker he represents the spirit and policy of the management. His responsibility to the management is to see that

the work is done, and that it is done correctly. He has to plan and utilize ways and means of supervising the work so that it is carried out in the best possible way with the least expenditure of time, effort, and expense. It is his responsibility to strive constantly to encourage the latent capacity of the workers in his charge, and in every way possible to enlist their co-operation. He will welcome their suggestions and will realize that "if you are to have the thought of a rough and untaught man, you must have it in a rough and untaught way. Only get the thought." He will encourage "job-pride" by seeing that good tools are provided, and that the equipment is in good order. He will realize the value of deserved praise, and when criticism is necessary will give it in a manner which will help the man to do better on the next occasion. He will recognize the fundamental human desire to produce, and will provide opportunity for the creative functions in his workers. He will give them the chance of intelligently adapting means to ends so far as the nature of the work will permit. He will foster intelligent working among his staff by letting each worker see how his own job is related to the process as a whole. And, finally, he will give effective direction to potential willingness to co-operate.

Interpreter of the Company's Policy.

In his position as interpreter of the company's policy, the foreman holds a very important position. The creation of a new spirit in industry, as the result of the elimination of prejudice and suspicion on both sides, is a slow process, and the initiative for the creation of this better spirit lies in the hands of the management. If the worker is to be brought to regard industry as the mechanism by which mankind maintains itself in existence, the best materials for producing this point of view are to be found within the factory in which he works, and the prudent employer will constantly strive to replace the attitude of passive acquiescence by one of active co-operation. This can be achieved

by revealing to the workers the policies that are being followed in the factory, the reason for such policies, together with an explanation of how the workers can assist in the working out of these policies to the benefit of themselves, the business, and the community. The correct interpretation of such policies is a prime responsibility of the foreman.

His Influence upon the Workers.

The mechanization of industry and the extreme degree to which the subdivision of process has been carried have been the principal forces in filling the world's store with the tools by which men gain the necessities, the conveniences, and the luxuries of life, and in putting within the reach of a rapidly-increasing circle of people the amenities of a higher standard of living. At the same time these beneficent forces have to a large extent produced our "labour problem." Under the old order the journeyman or mechanic carried through the complete manufacture of a product, building it up piece by piece and stage by stage largely on the principle of "fit and try again." He acquired his skill at his trade as the result of a long apprenticeship served under a skilled artisan. He selected his material, designed his product, determined the methods to be followed, and planned his own work. His work was marked by his independent individuality, and his reward was proportioned to the merit of his achievement. His modern counterpart is a skilled worker tending mighty machines, no longer producing, or even reproducing, a complete article, but only performing over and over again some one of the series of operations necessary to the production of that article. He may not be expected to be expert in the all-round use of the machine he tends, and may be trained in the production of one type of product. The skill of creation is centred more and more in those specialists who design the tools, the machine, and the product, and the work may require little beyond muscular effort. The material on which he works is selected for

him and he has generally no responsibility for the quality or quantity of the supply. His work has lost individuality, for each part is turned out to standard pattern, perhaps on automatic machines, controlled in all of its dimensions by limit gauges. The incentives to the worker to put forth his best efforts under such conditions are mainly financial, but the value of non-financial incentives must not be forgotten. The foreman, standing in direct contact with the men, can do far more than anyone else to promote the best mental attitude of the worker to his job, and he can do it in proportion as he realizes that the working force are more than "workers"; they are human beings, and their state of mind is affected by many things which to a greater or less extent he can control. The development of interest in the work and the promotion of satisfaction in the job put much responsibility on the foreman.

Good management seeks to promote and maintain the interest of the workers. Ambition can be utilized in promoting and retaining interest in several ways. In the first place, ambitious workers perform their daily tasks in such a manner as to attract attention and indicate their fitness for promotion. In such cases the wage payment does not balance the account; a part of the expected reward is advancement in the organization. If a man feels that "merit counts," and that it is the policy of the firm to give the best men a chance of promotion, interest in the job will be increased. A firm cannot guarantee promotion, or bind itself never to introduce new blood; yet, if an administration systematically introduces men from outside into the higher positions, its actions tend to be construed by its employees into a decision that the service it looks for is such as will exactly counterbalance the contents of the wage packet. If a man feels that no matter how good he is, or how earnestly and carefully he is fitting himself to take on greater responsibilities, he has little or no chance of recognition for promotion, he will be discontented. The question of whether to train from the ranks within the

organization or to engage well-educated outsiders for the responsible positions is of vital importance to every business. The right spirit and organization will put vitality into the entire factory, and a wise administration will provide opportunity for the spirit of ambition to be gratified, by forming the executive positions into a ladder, or, better still, into a series of steps, in which the work of each position in the organization is a preparation for the next higher position.

A Proper Day's Work.

The problem of what is a proper day's work for a man carefully selected and trained for his job, and paid in such a way as will call forth his maximum effort, is one of the major problems of production. In the past the answer to this question has generally been based on judgment, guesswork, and tradition. Where a system of payment by results has been in force, the usual method of fixing a new rate has been for the management to propose a rate based on past experience and the judgment of the foreman. If, after discussion, the workers do not accept the rate, negotiations between the management and workers' representatives follow, with the victory going to the party which for the moment possesses the greater bargaining power. In practice this method has generally failed to give satisfactory results, for the bickering and dissatisfaction occasioned by such methods are not conducive to the growth of a co-operative spirit.

Time Study.

In line with the general movement in the direction of substituting fact for opinion, and measurement for guesswork, the development of the technique of time study gives management a better plan to offer. Time study has been defined as a "searching scientific analysis of methods and equipment used or planned in doing a piece of work,

development in minute detail of the best method of doing it, and accurate determination of the time required."¹ It is an attempt to find out by analysis what are the best conditions under which work can be carried out in any workshop with the best known standards of workshop practice, and to standardize these conditions permanently. The time taken by the average worker, working at his normal speed, which can be maintained year in and year out without physical or mental injury to himself, is measured as accurately as circumstances permit under these standardized conditions. If, during the taking of the time study, operations or movements which are unnecessary to the job in hand are made, the worker is trained to eliminate these, and the time study is repeated under the new conditions. Allowances should be made for necessary delays and fatigue, and the rate based upon the time taken.

In Great Britain, the introduction of time study into a workshop often presents difficulties. The average worker feels that his method of working is something personal, and that the time study method of measuring his rate of work is an affront to his personal dignity. He alleges that the primary and only purpose is "speeding-up," and that acceptance of the method will reduce his status as a human being. Dissatisfaction concerning the introduction of time study methods generally arises from the way in which the method has been introduced, or from the lack of good faith on the part of the management or the workers whose work has been studied. Sometimes trouble has arisen from the fact that the set conditions under which the test was made are not reproduced in practice. Failure on the part of the management to secure these standard conditions is serious, and can be averted by recording carefully the actual conditions of the material, tools, equipment, lighting, etc., at the time the study was made. If at any time the standard conditions cannot be fulfilled, the worker should be made an allowance to compensate

¹ J. W. Roe, *Management's Handbook*, p. 799.

for the drop in earnings caused by the failure of the management. When the method is properly understood by the workers they will probably urge its extension, for, assuming confidence and honesty on both sides, it is better to work to standards of output based on measurement rather than on opinion or judgment alone.

The value of time study to the employer is not confined to the fact that by its use rate setting can be taken out of the heated atmosphere of bickering and controversy. It provides the opportunity for the critical study of the elementary operations, the elimination of unnecessary movements and delays, and will compel attention to be given to the attainment of the one best way of doing every job. The necessity of ensuring standard conditions for all the jobs running in the shop is a constant spur to a high degree of managerial efficiency.

Foreman's Supervisory Responsibility.

The responsibility of the foreman for the supervision of equipment, operations, and processes, will vary with the type of factory. If the business is of the jobbing type, producing dissimilar items or services where there is practically no possibility of repetition, and where, as a consequence, each item of product must be manufactured individually, the importance of good foremanship will not be the same as in general production or mass production. In general production we have the manufacture of a range of similar items, where there is some possibility of repetition work, and a possibility of manufacturing allied products by similar methods or processes. Mass production, on the other hand, cannot be effective unless there is continuous production under standardized conditions, and a scientific method of control carried to an extent impossible under either of the other two types of production. Jobbing production generally necessitates the employment of highly skilled labour, for there is little chance of employing general indirect labour, because the preparative and

contributory work is small. The equipment used will be largely of a standard type, and a large variety of machines will be necessary to meet the inevitable variations in manufacturing operations that will be called for by the varied nature of the work undertaken. The material problem demands close and continuous personal effort on the part of the foreman, for it is impossible to carry stocks of any parts except those which are absolutely standard. In this type of production, promptness in obtaining the material is often of greater importance than the price that has to be paid for it. In the main, the supervisory staff has to control the production very closely. There is little scope for pre-planning, and a large amount of reliance has to be placed on the skill and judgment of the individual worker. In such a factory the foreman must have the special technical knowledge, the manipulative skill, and the wide experience which will enable him to instruct the workman as to the nature of the material provided, the order of the operations, the type of machine, the rate of operating the machine, and the tests to be applied to the product. There is generally great scope for the exercise of ingenuity in the choice of alternative methods of doing any particular job, and the alert foreman in this type of factory can greatly influence the cost of production.

In general production the responsibility of the foreman is increased, and that of labour is diminished, while the obtaining and treatment of the material used are of greater importance than in jobbing production. If every advantage is to be taken of the possibility of repetition work, careful pre-planning of every detail involved must be made, both of material and human effort. Less reliance is placed upon the individual skill and degree of application of the worker, and his effort on each operation needs to be regulated very carefully. The selection, purchase, routing, and transport of materials have to be systematized, and the productive methods as regards worker and plant have to be more carefully planned to avoid delays, and ensure

economical utilization of the resources of the factory. Here the responsibility of the foreman is determined to a greater extent by the particular character of the product, and the scope of his job under the organization. In a chemical plant, for instance, the order of the processes, the yield, the precise method of using each type of equipment, etc., will probably be determined by the laboratory. In a machine shop, the operations to be performed, the assignment of units of equipment, the speed of cutting, the depth of cut, the tolerances allowed on the finished product, may be set out on an operation sheet prepared beforehand by a factory planning department. In such a case among the more important criteria to be applied to the work of a foreman are—

1. The degree to which he sees that machines are kept up to full load, but not damaged or abused, and the degree to which he reduces his idle load.

2. Where, in an emergency, special equipment arrangements must be made, the degree to which he succeeds in making arrangements to meet the emergency and yet keep down the cost.

3. The extent to which he keeps down operating waste.

4. The economy in the use of power and labour.

The mass production method calls for the greatest degree of pre-determination and skill on the part of the management. The use of greater quantities of specialized plant, of specially selected workers trained to perform subdivided and repetitive jobs according to carefully prepared and detailed instructions, demand a balanced scheme of production and planning of an extremely high order. Here the foreman discharges his responsibility by carrying out the instructions outlined for dealing with materials, equipment, operations, and processes. He may have to furnish reports on the material being worked up into finished product, as well as the amount of finished product obtained from a given set of operations or processes. He observes, records, and reports, generally leaving the

responsibility for action to the person to whom he reports. The furnishing of prompt and accurate reports will form an important part of his work. Even with the best system of planning in operation, breakdowns in organization will occur, and the speed with which such occurrences are dealt with is a measure of his value as a foreman. He must know when to ask for orders, be able to carry out orders intelligently, and exercise judgment regarding the necessity of checking or referring back, when some event occurs that was not foreseen when the orders were issued. He must provide for adequate supervision to cover all the operating points where necessary, distribute his time as a supervisor with due regard to the importance of the requirements of each job, and be always available in case of emergency. He must be able to co-operate actively with his superiors in the organization, and also with the foreman superintending the operations before and after his own. Above all, he must be a leader and inspirer of his workmen, seeing to the maintenance of right working conditions, setting the tone and providing the proper atmosphere for all to co-operate in the success of the joint enterprise.

IV

CONTROL OF MATERIALS

In most businesses the cost of materials represents the largest single item of expense in manufacture. Consequently adequate attention should be devoted to proper selection, safe custody, and efficient and economical handling of the materials used in the factory. The layout of the factory is largely determined by their nature ; processes and operations are planned to secure their economical handling ; in their economical purchase and use the greatest gains of management can be accomplished.

Purchasing.

In the past, purchasing has generally been regarded merely as a phase of production, but nowadays it is receiving

considerable independent attention. Manufacturers are realizing that savings effected on the buying of materials are just as real profits to the concern as those made through the adoption of economical methods of manufacture. The chief duties of a purchasing department may be set out as follows—

1. It must keep the productive departments supplied with the necessary quantity and quality of materials with the minimum delay.

2. It must provide a mechanism to ensure that the firm is receiving exactly what it is paying for.

3. It must consider which, amongst a range of grades of any given material, is best fitted for the purpose in view, due regard being paid to relative costliness. It is not necessarily the best or the cheapest grade that is wanted, but the cheapest that will give satisfaction.

4. It must buy on the most favourable terms.

5. It must lock up the minimum amount of capital in stock.

Size of Business Affects Development of Purchasing Organization.

The complexity of the purchasing problem varies in the first place with the nature of the business. The conditions in industry vary from the simplest case, where the task consists in filling definite requisitions for ordinary standard or staple commercial articles in specified quantity and grade, to the more complex case of a business dependent on fluctuating material markets. Here success will depend not so much upon the known or visible needs of the productive departments of the firm as on a skilful forecast of the probable future needs in a rising or falling market. The complexity of the problem also depends on the size of the business. Where the raw material requirements are small, purchasing will be regarded merely as a phase of the work of the works manager, and he may delegate this responsibility to a junior executive. In proportion as materials are

subject to wide or sudden market fluctuations, either in the question of price or the supply available, the function of purchasing requires higher qualifications. The skill and knowledge required to buy such commodities as silk, sugar, or cotton is greater than that required to buy stationery, typewriter supplies, etc. Where the business is large, it will be found necessary to set up a centralized purchasing function. Moreover, in some businesses, the variety and nature of the materials used call for specialized knowledge of a kind very different from that necessary for their fabrication. Further, the larger the quantities to be purchased, the better it will pay to employ technical advice as to the specification of the commodity.

Factors to be Considered in Purchasing.

Whatever the form of organization adopted, the problem of purchasing remains the same, and for convenience we will assume in our discussion the existence of a purchasing department, managed by a purchasing agent. In the first place, it will be noted that, in fulfilling the requirements indicated above, he will need to balance several opposing factors. These are price, time, and service. It is easy to buy closely as regards price, if he is prepared to neglect the importance of prompt delivery, or the necessity of keeping stocks low. It is easy to keep stocks low while waiting for opportunities to buy cheaply, and so hold up departments for materials. It is easy to eliminate any chance of delay by accumulating large stocks, regardless of price.

The purchasing department is a service function and exists for the purpose of meeting, in the most exact and economical way, the needs of the other departments. Its duty is to supply the producing department with the proper quantity and quality of materials at the proper time. Failure to bring forward the material at the proper time is disastrous, because in proportion as productive departments

are organized on modern lines, with detailed planning and progressing of the operations in advance, shortage of material becomes more serious. In addition to securing the quantity of material required, care must be taken to see that the quality is right. The attaining of a high standard of quality in the product depends upon materials of proper quality being kept uniform by careful purchasing and inspection. It is impossible to plan the work of the operations in the factory unless there is uniformity in the product.

Inspection of Quality.

Some materials can be bought on standard specifications recognized throughout the trade, but in most cases it is necessary for the buyer to have skilled assistance in the inspection of the goods purchased. It is very difficult to distinguish different qualities by casual inspection, even by an experienced man, and it is generally desirable to set up chemical or physical tests to be applied to the material ; in other words, to buy on technical specification. The purchasing of important materials unassisted by technical specifications requires greater shrewdness and wariness than purchasing when such assistance is available. In these days we have not moved very far from the conditions which led an eminent British statesman to declare that "adulteration is a legitimate form of competition," and simple tests for quality can easily be circumvented by unscrupulous suppliers. The only way in which it is possible for a firm to know that it is getting exactly what it is paying for is to buy on technical specification, and to set up systematic testing of all important materials. The specifications will contain detailed instructions to the purchasing agent as to what is wanted, and the tests, physical or chemical, that should be applied to the material on arrival. They will deal with the direct materials, that is, those destined to become part of the finished product, and will indicate such qualities as the chemical composition,

tensile strength, hardness, etc., of steel or iron, the strength and purity of dyes, drugs, or chemicals, the quality of leather, the weave and strength of cloth, etc. In the same way, supplies of such indirect materials as oils, varnishes, grease, dies and taps, gauges, and other small tools, will be subjected to test, if the amount expended on these items warrants it. The specifications will sometimes indicate special brands of articles, but as a rule should be confined to specifying qualities, leaving the question of quantity, price, and firm of suppliers, to the judgment of the purchaser. Where a technical department exists in a factory, it may not only specify the qualities of the materials to be bought, but may also indicate the possibilities of large economies by research into alternative kinds or grades of materials which, though cheaper, still give complete satisfaction in use.

Consideration of Price.

To buy on the most favourable terms consists essentially of harmonizing two factors. We have seen that the minimum quantity of material to be ordered is based upon the manufacturing programme. The other consideration is knowledge of the state of affairs in the commodity market, which would indicate when the most favourable prices prevail. In many classes of business, the purchasing problem is complicated by the fact that the demand for the product fluctuates according to the season, and frequently these seasonal demands come very close to the period of actual consumption. An unexpected demand may then require a very large output at short notice, and the reverse position is just as likely. In such circumstances the question of purchasing is dominated not only by the market for raw materials, but also by the probable condition of the selling market. It will be clear, therefore, that the purchase of raw materials must in these cases be controlled by considerations of the probable demand for the finished product.

Purchasing Policy.

When the raw materials dealt in are subject to sudden or wide market fluctuations, the situation demands the greatest possible skill on the part of the purchasing agent. To plan a purchasing policy intelligently in such cases, long views must be taken. In the first place, it is necessary to make as accurate a forecast as possible of the probable movement of the business curve on which to base estimates of the position of the particular business. Each individual business has its own cycle of business which may precede or lag behind the varying conditions of industry as a whole, and this fact will have an important bearing on the general purchasing policy. In the second place, it is necessary to have a knowledge of the approximate future requirements of the various kinds of materials sufficiently far in advance to take advantage of the probable swing in commodity prices. This, of course, is only possible where a consistent and long range policy is being consciously followed by the business as a whole. In recent years a large amount of time has been devoted to the study of the fundamental characteristics of commodity price movements, and while it must be recognized that such development is yet in its infancy, this research work is beginning to make more accurate forecasting of prices possible. The purchasing agent who would plan out his policy with the help that such research can provide will find that for most commodities there are four groups into which the price fluctuations can be grouped. There is first of all the seasonal fluctuations ; these are definitely periodic, and are repeated with minor variations from year to year. Then we find the cyclical variations, due to forces connected with economic or business cycles, and experience shows that these occur with a considerable degree of regularity. Secular fluctuations are the smooth, regular, long term movements of prices, either constantly upward or constantly downward for long periods ; and finally we have the irregular fluctuations due to accidental circumstances and which, unlike the three

preceding types, cannot be foreseen. These types of fluctuation have been carefully studied for most of the principal commodities, and the fullest possible use of such information will be made by the wise purchasing agent. He will probably have to supplement this information with records of his own relating to the particular branch of the industry he is catering for, and interpret the general tendencies in the light of the needs of the individual business for which he is acting. The study of graphical representations of the fluctuations of the production, consumption, and stocks of the chief materials used will prove profitable, especially if these fluctuations can be related to the changes in price level.

Assuming that such information is at hand, the purchasing agent will be able to determine future probabilities from three different points of view. In the first place, he will know the probable direction of the future trend of price for each important commodity. Secondly, he will have a fairly accurate idea of the time of future change in trend, and, finally, he will have some indication as to the extent of the movement in the general direction. With this knowledge in his possession he will be able to take advantage of special market conditions by making extraordinary purchases, at prices which justify the holding of stocks larger than those normally carried.

Stores Control.

Materials purchased are passed, after verification of quantity and quality, into the factory stores, where they remain under control until required for manufacture. The method used in storing stock differs according to the nature of the material. The method of storing coal or pig-iron in a factory is generally to dump it in a pile in a yard, or in bunkers. Cocoa beans are piled up in a warehouse in large sacks, weighing about 140 lb., in regular tiers from the floor to the highest point near the ceiling. Engineering stores are placed in storage bins, or on racks, according to their size

and nature. Timber has to be housed in specially ventilated and conditioned sheds, to enable it to be carefully seasoned.

Scientific storekeeping takes its cue from scientific cash-keeping. Stores must be dealt with as one deals with cash. Only a man of the highest integrity and reliability should be entrusted with the handling of cash, yet we often find complete indifference as to the storekeeper's suitability for his job. He should account for the balance of stores as a cashier accounts for his cash balance. To enable him to do this, it is necessary to set up a system by which a careful and immediate record is made of every addition to, or withdrawal from stores, either in stock books or other permanent form of record. No goods should be issued to the factory except on the receipt of a signed requisition, so that each issue can be traced and identified with the job and with the workman. A continuous or perpetual inventory should be kept, preferably on cards, and the balance should be checked systematically by physical stocktakings, preferably when the level of the stores is low. This is facilitated by the systematic and accessible arrangement of all stores, together with a proper classification of the items. If carefully determined high and low limits are fixed for every item in stock, the storekeeper can give an automatic warning of the approach to the minimum on the one hand, and prevent over-investment and unbalanced accumulation on the other.

Some of the other considerations which have to be borne in mind in devising an economical storage system are concerned with the orderly safe keeping of the stores. Many stores are badly damaged if exposed to the weather, e.g. castings deposited in the open outside the machine shop. Even coal stored in dumps suffers damage through exposure, and there is the added danger of fire through spontaneous combustion. It is well to remember, however, that the cost of protection against damage may be increased beyond the value of the goods themselves. Loss through evaporation, leakage and theft, and deterioration due to

improper storage will occur if unsuitable containers are provided. The cost of storing goes up or down in proportion as the containers used are of the right kind, in suitable condition, and are of the capacity most effective for the amount of material to be stored. The nature of the material stored has a good deal to do with the liability of loss through theft, small goods being more easily hidden and carried off. There is a great temptation to the storekeeper to carry all the stock the accommodation will carry. He is liable to greater criticism for his errors of omission than for those of commission. He gets into serious trouble if production is held up, or additional expenditure has to be incurred for rush shipments to replenish exhausted stocks, and there is a great temptation to play for safety by going too far in the direction of tying up money in surplus stocks with the risk of deterioration and obsolescence.

Materials in the Workshop.

Only general ways and means of dealing with materials in the workshop can be suggested, since each job offers different angles from which materials must be viewed, and each particular case must be dealt with on its merits. The methods of carrying out any operation are generally predetermined, but any foreman who is entrusted with carrying out processes or operations is expected to know the working properties of the materials used, and what danger of adulteration, waste, or spoilage exists, how it may come about, and how to minimize the danger. His knowledge will, of course, be specialized in its application to the particular problem, and need not be broadly scientific in its nature. On his shoulders rests the responsibility to produce a given amount of product of a standard grade from a given stock. For example, in the chemical and kindred industries the question of yield is all important from the cost point of view, and the amount of product depends upon the efficiency of the supervision. The control

of the amount of operating waste, or the amount of stock which is normally expected to be lost at each step of manufacture, depends on the foreman, even where the methods to be followed are closely scheduled. He has the power of recommending changes in the procedure, or of initiating special features based upon tangible evidence which can be brought to the attention of the management. In order to allow for wastage and for irregularities of machine capacities and requirements, partial breakdowns of machines and power supply, it is desirable to arrange for the provision of "buffer stocks," by accumulating stocks of intermediate products at the end of each of the processes.

Production a Steady Flow.

It is essential that there should be good general organization to save time in carrying the work through, so that production proceeds as a steady flow. There must also be an efficient system of internal transportation of materials. Wherever there is a continuous flow of articles of approximately the same size, it is advisable to install some system of mechanical conveyors. In a power house, for example, the coal may be dropped from the trucks into hoppers, whence it is fed by gravity into the hoppers of automatic stokers which convey the fuel to the furnace. In modern boiler plants the fuel passes through the furnace in an even layer, on an endless band, and when properly consumed falls into an ashpit to be raised again by bucket conveyors to the road level. The degree to which conveyors are of the proper type, of suitable capacity, and are used properly, affects the cost of handling goods. The distance the goods have to be moved is also an important consideration. Just as horse transport is found to be most economical in large cities where large loads have to be moved short distances, so in a factory the relative advantages of using mechanical conveyors and of using trucks and barrows requiring human effort, have to be decided according to the local conditions. Where trucks are used the stocks can be

handled more cheaply, if they are so designed that a maximum amount of material can be moved by a man with as little effort as a smaller amount on a different kind of truck. The question of the internal transportation of material is intimately bound up with the question of factory layout. Where possible, the utmost use should be made of gravity as a motive power for materials. In a flour mill the grain is usually elevated to the top of a high building and, without the intervention of any human handling, drops stage by stage through the various processes till the dispatching department is reached on the ground floor. In certain products, such as food packages, it is desirable to exclude human handling as far as possible. To attain this end, empty cartons are fed in continuously at one end of a moving belt conveyor, and pass under the spout of a hopper, from which they automatically receive the precise quantity by weight necessary to fill them. Continuing on their way, the filled cartons pass under a gumming device and a set of mechanical fingers, which automatically fold them down, and hold them till the quick-setting glue can seal the packet.

Whether mechanical material-moving devices are installed or not will depend upon the precise circumstances of the factory, but, whatever the method of transport used, there are several principles to be followed if the materials are to be moved about as cheaply as possible. Straight line production depends upon the layout of the factory, but in most factories modification in the layout will enable economies in handling materials to be effected. Reduction in the number of times the work is handled ; elimination of the picking up and putting down of work ; so far as possible keeping the work on the same level during the complete sequence of operations ; making gravity supply the energy of propulsion wherever possible, are a few suggestions of the possibilities of economy in this direction.

In concluding this survey of some material-handling problems, it may be well at this stage to refer to the use

that can be made of mechanical handling devices for setting the pace of a workshop. Where the plant is ingeniously and carefully designed in every detail of machine and layout to give continuity and reliability of balanced production, the speed at which work flows through the departments becomes almost automatically regulated, and supervision difficulties are reduced to minimum.

V

CONTROL OF MACHINES

Principles of Plant Arrangement.

It is obvious that the arrangement of a plant and of its machinery is determined by the nature of the processes to be carried on. In fact, the ideal plant would be that which is built round the process. Too often do we find an arrangement of the plant layout to fit the building, rather than the adaptation of the building to fit the process and machinery. No definite rules can be laid down, since the requirements of each individual concern will be different, but two general principles may be noted—

1. **FLEXIBILITY.** Flexibility is the characteristic of a successful industrial layout. There must be proper provision for future expansion, so that departments can grow without losing their identity in any way, or preventing the extension of other departments. A well-planned arrangement of buildings and processes is the secret of the most economical manufacturing plants. The utmost degree of flexibility must be secured so that the processes may be re-located, or new types of machinery may be installed without involving further structural alterations. It will be seen that the scientific control of production begins even before a plant lay-out is decided upon.

2. **PRODUCTION AS A FLOW.** The second consideration to be taken into account in the arrangement of plant is the importance of regarding production as a flow of work.

In an established business the problem is how to arrange the fixed equipment so that the material will pass through the sequence of operations with the least amount of handling and in the shortest time. An important consideration is the weight of the parts to be produced. Generally speaking, the most efficient arrangement is to move the heavy bulky parts as short a distance as possible. The smaller parts can be made in bulk and issued to the assembly section in quantity, transport being thereby minimized. The continuous flow of work is most easily planned by establishing a "flow sheet" for the whole plant. This is a diagram showing the buildings, the separate departments, and the routes of internal transport of the material, so that the operations and processes can be located. Then it is necessary to make a similar sheet, showing the start, route, and finishing point for each individual piece. A study of these flow sheets will indicate what arrangement will lead to the most economical production. In this connection the quantity to be produced is a deciding factor. Where there is a very large output the "line system" is the most effective. In this arrangement the various machines and processes are arranged so that the sequence of operations requires the article worked upon to progress steadily forward to the finishing point, much in the same way as the framework of a Ford car moves along a travelling band, and by the addition of the various elements becomes a completed car. This system cannot be utilized to its best advantage for the production of small quantities. The line system of production generally requires an extensive use of conveyors and other forms of mechanical transport of work in progress. It is necessary under this system to place quality inspectors in the sections, and to have the material and component stores in readily accessible positions. The cost of supervision, progress, and clerical work is, moreover, reduced to a relatively small amount. When the quantities of work to be performed do not justify the installation of a complete line system, advantage can be

taken of some of its features. For example, it is possible to lay out the heavy machinery for the main components in operation order, provided that the quantity of output required is sufficient to keep them nearly fully employed. Then the machinery for minor components or assemblies can be grouped according to type in side bays or galleries, and the sequence of operations on these assemblies arranged so that the completed minor assembly can strike the line of the main production at the appropriate point. If this method is followed, a comparatively small number of the larger and more expensive components can be put through in convenient batches, thus reducing the cost of production of the completed article.

The manufacture of certain lines of products lends itself peculiarly to departmentalization on the basis of product, so that appropriate machinery is provided to enable the completion of that product within the department. In other classes of manufacture machines performing similar operations are segregated and the materials routed through the departments where the appropriate operations are performed. Where the completed product is made up of an assemblage of separate parts, the layout is generally designed to permit of the parallel fabrication of the elements in a direction leading towards the assembly and storage departments.

Balance of Equipment.

When the location of the departments has been decided upon to allow the maximum use of devices for handling materials, and to ensure the minimum time for materials to progress through the plant, the next step is to fix the amount of equipment necessary for each process, so that a proper balance with regard to equipment will be maintained. Some factors which will enter into this decision will be the output capacity of the machine, the amount of actual running time that can be anticipated, and the necessity for maintaining reserve equipment to cover

breakdowns. The importance of the proper selection, arrangement, installation and maintenance of the plant and their bearing upon production costs cannot be exaggerated.

Economical Use of Machines.

Assuming that all the changes in the layout of processes and machines which have been considered desirable have been carried out, consideration must then be given to the factors involved in the economical use of the machines. The task of the works or production manager is to ensure that there is a proper volume of work assigned to the machines adapted for the job, and that they are worked up to capacity at all times. When, either by automatic recorders or by careful observation, systematic records have been compiled of the proportion of time that machines are actually standing idle, the results have in some instances been amazing. From 10 to 25 per cent of idle machine time is not an unusual proportion. The effect of such idleness upon production efficiency, particularly at times of high pressure of work, is serious. If, in addition to the actual idle time, the reason for stoppage is recorded, the manager is supplied with information to make the foremen more appreciative of their responsibilities. Idleness due to lack of work, absence of machine operator, repairs, power failure, etc., can be brought to light and the responsibility placed where it belongs. Moreover, requisitions for additional plant can frequently be legitimately turned down on the grounds that the utmost use is not being made of the existing equipment, and the planning department can be "kept on their toes" to ensure an adequate supply of work ahead for each machine.

In many small production plants the machines most commonly used are of accepted standard design, and it is possible to exercise considerable choice of methods. In such cases care must be taken by the planning department that important or urgent work is not being held up on a

particular machine by some job which is of secondary importance, otherwise it will be impossible to make delivery promises with a reasonable degree of accuracy and certainty.

Whether the machines are running on the most urgent work at the maximum possible speed is a crucial question for the manager, involving both the efficiency of the operator and of the machine. On his part, he must ensure that the work is flowing to the machine as fast as it can be used, and no faster, and that it is taken away to the next operation as promptly. He must ensure also that the machine itself is in first-class condition and that the tools are kept in proper trim. There must be proper handling devices, so that the work may be handled in and out of the machines most expeditiously. Proper working conditions must be provided, e.g. there must be proper illumination, so that the operator is not handicapped and delayed by lack of sufficient light.

Maintenance of Equipment.

In a small factory the maintenance of the equipment will probably be the job of the workers operating the machines, but in a large factory, particularly where a large amount of machinery is required, it will be found necessary to set up a separate maintenance or equipment section. Such a department would be charged with the task of selecting and installing new plant, and maintaining the existing plant in first-class condition. Systematic lubrication and inspection of the plant will tend to keep the chance of extensive—and expensive—breakdowns to the lowest limit. A policy of anticipating repairs by timely renewals and overhauls will save money. The existence of an equipment section will make it possible to conduct investigations into the performance of machines. To bring machines to the proper pace is a fruitful line of activity. Carl Barth tells of a visit to an engineering factory where he found lathes producing only a fraction of the output that he knew was possible. The manager assured him that they had speeded

up the machine to its utmost capacity. Examination of the position showed, however, that it was possible to execute the type of work in question in less than one-tenth of the time. The tools were badly designed and in poor condition. The operator had set the speed of the machine and the feed of the cutting tool much below what was possible. The result was a demonstration that even the maker of the lathe was ignorant of the capacity of the machine. Such an analytical examination can with advantage be applied to most mechanisms. Investigation into the proportion of idle time and actual running time often reveals weaknesses in the organization of the work of the shop.

Mechanical aids to management in the form of recording devices are now being widely used. The burden of the routine control of machine operation can be passed to mechanical devices which are automatically operated. Counters, automatic scales, temperature indicators and records, electric and steam meters are typical examples of such mechanical checks on the efficiency of the operation of the machines.

VI

CONTROL OF METHODS— STANDARDIZATION

The modern development of the idea of standardization in industry is but an intensification of the tendency of man to evolve a typical unit, embodying the best experience and knowledge available. During the last century over one thousand railway companies were floated in Great Britain, but they all found it convenient to adopt the same gauge, which makes continuity of travel possible from one end of the island to the other. The advantage of making bricks to a standard size, screw threads of the same dimensions, the interchangeability of parts, etc., is apparent to all. The word "standardization" as applied to industry is used in a somewhat narrower and different sense than is

commonly understood. Standardization is the determination of the best material, equipment, and process discoverable at any given time, and adherence to it till a better is found. It has been well said that every live business is perpetually in a state of transition. Too often the picture conjured up by standardization is that of a rigid crystallization, of something definitely fixed and unchangeable, so that application of the idea of standardization to production may be thought to lead to a state of ossification and death. Far from standing in the way of progress, the proper conception of standardization rather stimulates and aids more rapid development. The idea of perfection is not involved in standardization. The standard method of doing anything is simply the best method that can be devised at the time the standard is made. Standardization practised in this way is a constant invitation to experimentation and improvement, for a standard persists only so long as it is the most economical method available.

We can have standardization of the product, the machinery used to make it, the means of production, or the methods and operations. There is one best way of doing a job, one design of tool for any particular job that excels all others, and one best machine appropriate to the task in hand. The successful search for the one best way results in the establishment of a standard. Let us imagine a skilled man attempting to devise a piece of equipment to replace a costly and cumbersome hand process in some little developed sphere of industry. His first step is to make an analysis of the process into its elemental or component parts. Each separate division of the process is further broken up into elementary tasks, each of which can be effected by a single procedure, either mechanical or chemical. These elements are then synthesized or put together into a provisional piece of apparatus. By successive steps larger and more delicate work is thrown upon the mechanism, and it is required to adapt itself to ever subtler varieties and shades of human requirements; to

perform one process after another that is needed for the ultimate object, with little or no assistance from the hand of man. Thus, by constant trial, it becomes an automatic or semi-automatic machine, and by such means a single mechanism is devised capable of achieving a complex result. But the original conception generally needs to be stripped of the trimmings and made fool-proof: indeed, the subtlest inventor works laboriously to simplify the apparatus, till at last only the expert can detect and marvel at the subtlety of his labour.

In some industries standardization is difficult. For example, the woollen industry deals with materials variable in character, and produces articles subject to changes in fashion. In some trades standardization involves the use of elaborate and expensive plant, with heavy fixed charges. The adoption of entirely new methods and inventions by competitors may render necessary the scrapping of this plant before it is worn out. Reference has been made earlier to the advantages of the standard railway gauge. To-day the chief difficulty in the way of the adoption of larger railway wagons, capable of taking greater loads, lies in the enormous expense that would be involved in enlarging tunnels, strengthening bridges and viaducts, etc., throughout the country.

Whilst standardization results directly in economy, the use of predetermined standards enables the production manager to keep that grip on production which is essential to efficiency. Costs of production by themselves are of little value. We must have standards of comparison so that the manager may know not only what the goods have cost, but also what they should have cost. The discrepancy between the estimated results and the actual results must be regarded as preventable waste, and a detailed examination of the causes of the discrepancy will point the way to cost reduction. Where standards are fixed, limits on either size of the standard should be determined, so that only the exceptionally high or the extraordinarily low

results need receive attention. Economical production and accurate planning of the work are impossible unless exhaustive tests are made of the capacities of the various machines and the value of the methods of work, so that systematic knowledge can be substituted for traditional opinion. Successful standardization depends upon the retention of the scientific attitude towards all the problems of production. Some manufacturers naturally take the initiative in bringing about improvements in the technique of their industry, industrial relationships, methods of production or selling, etc. Others are quite open-minded, but not so venturesome, and are ready to fall into line once demonstration of the success of the innovation has been made, while a large class adopt changes only when competition leaves them no alternative. Few deliberately organize their plants for systematic development, and these alone can claim to be "conducting" their businesses. A business can be conducted by accurately planning in advance every operation and every movement necessary to the manufacture of the final product, or it can be carried on by a constant "follow-up" of the product as it progresses, which indicates any items or operations falling behind in the progress of the work through the factory. Then pressure is brought to bear on the lagging items to bring them into line with the balance of the work. When Frederick Taylor, nearly a generation ago, was carrying out his experiments, he found himself hindered by the hide-bound attitude of his fellow countrymen, and so placed great emphasis upon the necessity of "that complete revolution (in mind) in recognizing as essential the substitution of exact scientific investigation and knowledge for the old individual opinion or judgment."

Scientific thought is purposeful inquiry in any direction. It is applicable to industrial and commercial problems, and is not the peculiar property of the professional scientist. The man who analyses and classifies facts of any kind whatever, who sees their mutual relation and describes

their sequence, is applying the scientific method. The habit of forming judgments upon the observed and classified facts, unbiased by personal feeling, is characteristic of the scientific frame of mind. To suggest, however, that the cultivation of a scientific attitude towards the problems of the factory is necessary, does not imply that the methods of the laboratory can or should be adopted in the workshop. In industrial life we have to be content with hypotheses which fairly cover the facts, without demanding proof that they do so exactly, or that no other supposition will do so. We cannot wait in practice for theoretical certainty. The scientific approach to a question involves two stages. The first stage is the analytical, which deals with things as they exist. The second, or synthetic, stage is creative and active.

We have seen that the productive work in the manufacturing departments involves—

1. The analysis in the most minute detail of each operation in the process of manufacture.
2. The elimination of all unnecessary motion.
3. The correction of defects and variation in materials.
4. The improvements of the condition of machines and tools as are necessary to permit of work being done most efficiently.
5. The determination by means of elementary time studies of the time that each operation or job should take under standardized conditions.

The importance of the various details and the degree to which they should be elaborated will vary in different industries, and in different businesses in the same industry, according to the particular kind of organization, and the established practice in the particular concern.

“ The essential things that have to be taken care of, whatever the system of administration, are—

- “ 1. The manufacturing departments must know exactly what is wanted, and in what quantity, and when it is wanted.

" 2. If the product is an assembled product, they must know precisely what parts go into it, what operations have to be performed on each part, and when and how they are to be assembled.

" 3. There must be definite orders for the performance of each operation on each piece, and for the assembling operations.

" 4. There must be some accurate means of identification of each part and each order, for the purpose of control, and, later, of keeping costs.

" 5. There must be some easy, accurate and quick method of tracing the progress of work on the order as a whole, and any subdivision of it.

" 6. There must be knowledge of the time each operation should take, in order that separate operations may be planned at the proper time, to bring together parts all at once when they are needed for assembly.

" With this information in hand it should be possible, with the proper foremen, to pass the work through as planned, and to get it done with the grade of workmanship which the policy of the firm requires."¹

Planning.

The positive control of all manufacturing operations involves a separation between the planning of the work and the execution of it. This points to the necessity of setting up a planning department, which will be responsible for the pre-planning of the work of all the departments in detail, so that jobs flow to the machine at the proper pace and are moved on as quickly, in economical batches which will involve the smallest proportion of setting-up or other preparative time. Work will be assigned to the productive centres, so that a proper balance is kept between the progress of the different jobs passing through the departments. If the manufacture is for stock, or for orders where there

¹ *Principles of Industrial Management*, issued by the Dennison Manufacturing Co.

is a possibility of repeat orders at frequent intervals, it will probably be wise to manufacture in lots, particularly if the operations are few in number and of short duration. Each lot would comprise a quantity large enough to warrant the provision and use of special jigs, and to reduce the proportion of machine setting-up time carried by each unit of production to a comparatively low figure. If the order is a "special," not likely to be repeated, several methods of attaining the desired results are generally possible. Thus, in a machine shop, turning operations can be performed in a lathe or on a boring machine, and flat surfaces may be machined in planing, shaping, or milling machines. The decision as to the method to be followed in such a case will probably be left to the shop foreman, who will have to take into account such factors as the relative times taken by the different methods, the relative amount of equipment available for one method or the other, the relative degree of skill required by workmen operating the different methods, and the greater possibility of spoilage by one method as compared with the other.

The delegation of part of his duties by the works or production manager to a planning department makes it essential that some means should be available for providing information in respect of adherence to or divergence from the plan, so that he can still retain the power of control. A progress or bulletin board provides the best means for this control. The form of the progress board will naturally vary with the type of work, but a good example is a large board which has listed on it every machine and productive centre in the department. Under the headings for each machine symbol is a set of three pockets or pair of hooks. The top pocket contains a card showing which job is now on the machine; the second, cards indicating jobs for which the tools and material have been moved to the machine, and which are, therefore, ready for the workman as soon as he has finished his present job, and the bottom, similar cards showing all the jobs which have been assigned

to the machine but are not yet ready. A system of coloured tags is used to indicate relative urgency, so that jobs of secondary importance can be kept back, thus enabling urgent jobs to be delivered according to delivery promises. This visual record of the progress of all the jobs on hand in the department affords a complete and absolute control of the work by the production manager, and where such a system has been adopted it has been demonstrated that it has been possible to make deliveries on time, to reduce the cost of production by cutting out delays due to faulty planning, and to reduce the amount of stock carried.

Maintenance of Quality Standards.

The maintenance of a regular standard of quality is an important part of the work of production. To a certain extent there is bound to be a conflict between the production of quality and quantity. Most systems of payment by results have the natural tendency to endanger the quality standard, and careful inspection is necessary to prevent spoilage of goods. Although these systems rest upon the supposition that payment will only be made for good work, the loss to the firm through spoiled work is much greater than the loss to the worker. The material has been reduced to scrap value, the wages and overheads on previous operations have been thrown away, and dislocation of the planning programme results from the spoilage. Where the business lends itself to line production, the inspection staff will be out in the shop recording the results of the regular inspections made at various stages of the production, and their records will enable the foreman to act promptly in order to trace the cause of wastage to the particular operative, machine, or tool, and so minimize the waste. In other circumstances it is only possible to inspect the product when it is finished, and as the damage is then done it is necessary to exercise close supervision and provide proper training facilities for the working staff.

VII

**RELATION OF PRODUCTION DEPARTMENT
TO OTHER SECTIONS OF THE BUSINESS**

This survey of the work of the production function may be concluded by a brief reference to the relations between production and the other sections of the business. In any manufacturing business there are four fundamental questions, namely—

1. What to make.
2. How much to make.
3. How to make it.
4. At what cost.

Discussion of the third question has formed the subject-matter of this section, but the production manager is vitally interested in all the other questions. A discussion of the questions of "What and how much to make" will be found in the section dealing with distribution. The influence of the design of the product upon the efficiency of production need not be dwelt upon at length. The accuracy of the sales plan or estimate governs to a great extent the cost of production in the factory, for upon this estimate the production and purchasing programmes are based. Undue optimism in making the estimate may result in needless expenditure on plant extension, in the purchase of large stocks of raw materials, and in the engagement of a staff too large to cope with the production that is actually required. The liquidation of large stocks of manufactured goods made to cope with anticipated amounts may result in heavy losses. From the factory point of view it is desirable to equalize the volume of production as far as possible throughout the year, and the translation of the sales estimate into production orders by the factory planning department should take account of this fact. Between the production and selling side of the business there must be the closest co-operation. There must be a harmonizing of the selling and the factory point of view, so that the first question might be re-phrased in the form of "What can be made and sold to the best advantage of the business?"

CHAPTER IV

PRINCIPLES AND PRACTICE OF INDUSTRIAL RELATIONS

BY CLARENCE H. NORTHCOTT

(a) THE PHILOSOPHY OF INDUSTRY

THE problem of factory organization necessarily includes that of labour relations. Organization implies arrangements whereby men and materials are to be brought to the right place at the right time. The flow of materials constitutes a different problem from the provision of men and women. The former are more tractable. Provided that circumstances do not lead to their destruction or deterioration, they can be moved from place to place without regard to other considerations. Men and women are not so tractable: they protest against being made the sport of chance or circumstance. They claim consideration for other elements of their natures than the physical or material. Their humanity and vital energies lift them above the level of commodities and enable them to make a dynamic contribution, either positive or negative, to the problem of organization. They can help or hinder the administrator who must, perforce, give thought to the problem of securing their co-operation and must approach it from the human side.

The necessity for this line of approach may be denied by those who, either from temperament or intellectual outlook, tend to under-rate the human element in labour relations. It is arguable that administration is a matter of order and arrangement, a question of government and control. Some one individual or a group, such as a board of directors, prescribes a policy which has then to be carried out under its direction. It is argued that in this arrangement the part of men and women is to obey. They must carry on at their jobs, filling their appointed posts

and obeying the orders, instructions and regulations laid down for them.

This contention is by no means wholly untrue. The administration of a modern business does call for clearness of arrangement, particularly as regards orders, and firm and clear-sighted control. But such a form of administration, if unrelieved by humane considerations, suffers from two cardinal defects—

1. The sense of proportion is lost. Rules, and penalties for breaking them, must be enforced. The offence may be trivial and the motives behind it or the circumstances attending it may be such as to mitigate its seriousness. Nevertheless, in a system of rules and regulations, delinquencies are transgressions and must be punished, though some may be only amiable weaknesses.

2. Those who administer a system of rules in this spirit tend to prove incapable of entering into the mental attitude of another person or of appreciating the rights of individuality. This defect has a psychological explanation. Rules are precise, logical and rational. The bureaucrat, because of his constant association with such rigid prescription of conduct, tends to assume that reason and logic are the factors that guide human nature, and to dismiss as foolish and simple those who are not thus guided. One is reminded of Carlyle's classification of the population of Great Britain as 45,000,000 persons, "mostly fools." In the political sphere, it has long been recognized that men and women are not guided fundamentally by reason and logic. Impulses and instincts govern much of human life, and by reason of their inherent strength and the range of their manifestation, place reason in the background. Neither loyalty nor output-efficiency is wholly a matter of reason and logic.

The chief reason why the claims of human nature are sometimes disregarded is this lack of understanding. Deficient insight may lead either to sentimentalism on the one hand, or to hard-heartedness on the other. The

sentimentalist exalts the human factor in industrial relations because he does not understand or will not face the weakness and wrong-headedness of men and women. The thoughtless employer refuses or forgets to consider human nature broadly enough to enable him to appreciate the strength of the non-rational impulses and instincts of men and women, and the distinctly ethical qualities inherent in the far too defective industrial organization of to-day.

General Approach to the Problem.

The history of industrial relations in Great Britain during the last half century and a review of the industrial philosophy of the last quarter of a century demonstrate that labour relations must be given an important place in business organization. The day of autocracy is rapidly vanishing. The methods and spirit of bureaucracy with which even the least intelligent worker became familiar during the years of the war, have already been tried and rejected. Wasteful and costly strikes, and similarly wasteful friction in firms and industries alike, have shown that the methods of the past will not secure the efficient working of the industrial organism. Industry is like a machine whose running must follow certain lines implicit in its own mechanism, but conditioned by the relative degree of friction and the positive application of lubricants. In other words, it depends upon the effective co-operation of its human units.

In this sense, industry is a part of society. In it, men and women are associated in an organized unity with more or less common interests and objectives. More or less consciously and deliberately, they have combined to produce goods and render services. As with society as a whole, it is divided and subdivided into classes and grades, which interact, combine or oppose each other. It has its own customs, rules and institutions on which a large part of general social organization is based. It must, therefore, be approached from the sociological point of view. But,

in another sense, industrial relations are the relations of individuals or groups, either with other individuals or other groups. They rest upon co-operation or conflict which, in themselves, depend upon such factors as mental attitudes, feelings, impulses and emotions. To this extent, they are psychological in nature and must be considered in the light of what we know of individual and group psychology.

Finally, industrial relations, involving continually varied forms of behaviour, have an ethical side. Industrial conduct is open to valuation. It serves, or fails to serve, ends that are esteemed by society. It gives or refuses liberty; it enhances or restricts equality. It is a matter of obligations, including what is due to the persons involved as well as what is due from them. Justice, fairness, honesty and equity are fundamental principles in industrial relations. These are ethical in nature, and demonstrate that industrial relations must be approached from the ethical standpoint.

We conclude that industrial relations are fundamentally human in nature. Any other form of approach thereto, whether through regulations or autocratic command, will fail to illumine their delightfully diversified nature. Industry is a living thing. It is the impulsive, creative activity of men and women who have come together, more without thought than with it, to work out common ends, and who remain a part of the society which supplies their other needs and gives organized coherence to their common life. Industry cannot be divorced from society. But neither can it be considered apart from its effect upon the individual men and women engaged therein, nor remain unaffected by their varying impulses, emotions, sentiments, and ideals. The dynamics of human effort are not to be expressed in mechanical, but in psychological, terms. Finally, justice, freedom and equality are ends to be attained in industrial relations and in the co-operative efforts which they imply. Ethics enter in as a third measure of the soundness of industrial relations.

Examining this position in more detail, we find that industry reflects social stratification in a number of points. Just as society is divided into classes, so is industry. The three social classes are reflected in the three classes of employers, management, and employees. The various grades within social classes are repeated in the numerous industrial grades such as those which differentiate clerk from worker, the craftsman from the unskilled man, or the lower managerial grades from the general body of workers.

These relations are never static. Society witnesses the continual endeavour of individuals in the subordinate classes to rise into a higher class or a higher grade of the same class. Success, measured primarily in terms of wealth, though frequently by service, qualifies for social advance. In industry, there is a similar movement, based on similar motives.

Just as a community or nation is progressive in proportion to the fluidity of the classes which constitute its social stratification, so industry is efficient and industrial relations harmonious according to the degree to which there is a clear road for promotion to the industrious, skilful, ingenious, and capable man. As the desire for advancement rests on psychological grounds, we shall return to it in the fuller discussion of the psychological aspect.

The Social Point of View.

Industry is admittedly but a part of the larger social unity. The welfare of society is superior to that of any of its parts and is to be attained primarily through the welfare of each class or section. Where industrial relations are in line with the best conceptions of social relations, the welfare of employees is assured. On the contrary, where industrial conditions fall below the level which has been achieved in the home and the other institutions of our social life, society is faced with a situation comparable to that of a sore or disease upon the body. Degrading,

unhealthy, and insanitary working conditions injure both the health and the *moral* of workers, and, through home and family, lower social health and corporate spirit. Inefficient and inadequate production, whether brought about by the payment of sweated wages, by inefficient management, or by ill-balanced organization, injures society by lowering the wealth of the national group and its command over economic goods. So, too, autocratic industry denies outlets to human personality. Most industrialized nations are in some measure politically democratic. Habits and attitudes fostered in the larger society are carried over into industrial relations. Workers of every grade are tending to demand some measure of that control over their industrial destiny which the nation allows them in political matters. Autocratic government in industry galls, chafes, and restricts. Such circumstances involve obligations upon society and industry alike. Society must guide and restrain those who control industry and bend their activity towards desirable ends. Industry must voluntarily adopt those ends or aims that are socially desirable and indefatigably pursue them. Failure to do so will cause social ill-health and force society to a degree of control and direction, whereas the adoption of this programme will produce a reciprocal advantage to society and industry alike.

This is not the place to detail the steps which society has been compelled to take in order to control and direct industrial activity. In one country, these purposes may be made effective through laws and the intervention of the State ; whereas, in others, an enlightened public opinion, manifested through the reciprocal action of employers and employed, may be equal to the task of controlling and directing industrial activity along lines beneficial in every way to society. One must remain content to draw attention to the numerous measures regarding health, accidents, hours of work, wages and conditions of employment, old age, sickness, unemployment, and so forth that are to be found in all advanced industrial countries.

More important are the obligations which the adoption of this sociological point of view imposes on industry.

1. It must pay good wages, up to the limit that it can afford. Wages represent consuming power, which is the basis of the standard of life. Inadequate and sweated wages necessarily lower this standard, restrict the quantity of food and clothing available, and reduce the quality of home comforts and other amenities of life. Where industry is paying less than it can afford or than it could pay with better organization or greater technical and mechanical efficiency, it is responsible for reducing the general level of social comfort. Moreover, where one industry errs in this direction, it is restricting the market of all other industries. Thus, when a disorganized and inefficient industry is paying sweated wages, the standard of life in surrounding districts is detrimentally affected, and manufacturers of all the articles consumed in or bought for the home do less trade than they would otherwise do. On the contrary, industries which have given attention to productive efficiency and have consequently been able to pay high wages, promote a higher level of economic prosperity and a higher standard of comfort.

As suggested, industry must be efficient before it can be lucrative. The establishment of the principle of high wages carries with it the obligation to devise means whereby such wages can be earned. This is in part a matter of forms of wage remuneration, but more so a question of good management, smooth and comprehensive organization, and the fullest use of technical and mechanical aids. Managers must be found who are alert, informed, imaginative and constructive, with a knowledge of organization and the temper and personality that qualifies a man to handle his fellows. Workers must be provided with every device that will save time and labour and increase production, and be paid for their effort and output in a way that satisfies their sense of justice. Industrial efficiency is a duty laid by society upon the shoulders of the modern manager.

2. Industry must afford good working conditions to all concerned. A large proportion of the hours of daylight are spent in manual or clerical labour. Unless working conditions are wholesome, physical and mental well-being may be lowered to such a degree that the hours of rest and leisure are not sufficient to restore or recreate it. Man is of all machines the most intricate, the highest geared, the most finely adjusted. Yet it is a standing indictment of industry that it pays less attention to its human equipment than to its apparently more costly mechanical apparatus. Society, however, which depends for its strength upon the physical health, the *moral* and the co-operative sense of the men and women who compose it, cannot condone such negligence. Sociological considerations compel industry to give much attention to conditions of work.

3. Moreover, they give point to the modern demand of the workers for a share in control. Political democracy has its counterpart in industrial democracy. In political democracy, each citizen has not only a voice in government, but also, provided his intelligence is normal, a store of knowledge of what is happening in the State. In any large firm, an ordinary employee has, in most instances, no voice in the government and control, little knowledge of the events and decisions which affect the progress of the business, and less knowledge of the policies which govern it. He may not be able to contribute much in respect of advice or knowledge, but purely arbitrary and autocratic decisions cut across his political sense and his self-respect. Moreover, there is no remedy for his incapacity except exercise of it in a constructive way, and under conditions that are educative in respect of knowledge, judgment, and responsibility. If stress be laid on his incapacity, the moderately minded worker will content himself with a request to be consulted on those things with which he is well acquainted, the methods, practices, and results of the workroom. If sociologically minded, he will contend that industry is a co-operative enterprise and that his co-operation can

more effectively be secured by rational methods of consultation than by the irrational giving of orders without explanation. There is no other way to treat full-fledged members of an industrial society.

4. Finally, industry owes men a measure of security of tenure of employment. Mental or manual labour is the chief contribution each individual makes to the general well-being. He owes this to society, and when he has given it, has the right to an equitable share in those necessities and amenities which constitute general well-being. A better organized, or a more ideal, society than our present one would correlate work and welfare, so that each individual could contribute that upon which his shelter, sustenance and comfort depend. This ethical concept is the justification for the view that the man willing to work, but unable to obtain employment, should not be entirely deprived of these necessities of life. Industry, in particular, has an interest in reducing these periods of enforced idleness to the minimum. Unemployment is demoralizing in itself : it lowers a man's physical and mental *moral* and reduces craft skill and adaptability. Fear of unemployment, widespread as it is among those actually in work, is nearly as demoralizing, and is the fruitful parent of discontent and "ca' canny." The sociological point of view exalts the needs of the worker and increases the responsibility of industry for supplying those needs.

Psychological Aspects.

But industrial relations are affected by psychological factors. Men and women react harmoniously to one another and to the conditions under which they work only when certain psychological needs and desires are met. Work becomes a satisfaction when men find therein scope for their capacities and opportunities for the expression of inherent impulses ; when they fit into their job, either by reason of their own temperament or because they have been trained to meet readily the daily demands upon their

skill, ingenuity, and adaptability; and when account is taken of claims and demands that arise from the failure of modern industry to adjust itself to the whole complex psychic constitution of man.

These three conditions can only be examined briefly: their implications must be left to later sections, when practical applications of psychology are being described. The first condition finds its justification in the economic and social wastefulness of any other line of action. An individual who has found his way into a vocation for which he is unfitted is invariably discontented and inevitably below standard as a worker. He is not happy in his present job, and even if he should find out to which type of job he is most adaptable, has lost many valuable years by reason of his wrong start.

The most important of these psychological considerations is the problem of finding in industry an outlet for the dynamic impulses that constitute human nature and human life. Industrial organization has taken little account of human aspirations. Too often, it has restricted its appeal to one type of incentive, the financial, in ignorance of the "pull" of the creative impulse, the desire to assert oneself and the love of power or even of adventure. To a large extent, it has run counter to these impulses, producing ineffective effort on the part of individuals and discontent on the part of the group. Its deficiencies have prompted demands from workers for a higher status and full human rights in industry.

Ethical Aspects.

Finally, both social and psychological considerations are linked up with the ethical. Industrial morality cannot legitimately be lower than that of society and the individual. Justice and freedom have value and weight in industry. A just valuation of human effort is an incentive to further effort and an appeasement of past wrongs. The satisfaction given by reasonable freedom of action sweetens the tone

of industrial relations. A fair wage, a just valuation of human life in comparison with property and machinery, opportunity to contribute the full power of one's personality in daily work, a due recognition of responsibility for duties to be performed, are reciprocal obligations within industry, falling equally upon the organizers of industry and their fellow-producers.

(b) WAGES

In the organization of industrial relations first attention must be given to wages. What rates of wages must the employer pay, not merely to satisfy the law, but also to obtain a sufficient supply of labour and prompt his employees to the fullest output? How is he to find what rate of wages will satisfy all these conditions? What limitations, if any, are there to his capacity to meet these conditions, and how may he, in the first place, find these limits, and, if he desires to do so, exceed them?

Trade Boards.

The minimum rates that may be paid are fixed for a number of trades and industries by Trade Boards, established under statute, and having power to enforce their decisions by prosecution and fine. These Trade Boards date from 1909, when the Trade Board Act was passed and applied to four trades. In 1918 this Act was extended, and facilities afforded for the establishment of a greater number of Trade Boards. In 1927 there were 44 Trade Boards, in 39 different trades, covering 1,250,000 workers.

Broadly speaking, these Boards have been set up where little has been done by voluntary organizations on the part of workers to enforce wages comparable with those paid in other trades. According to the regulations of the present Act, Boards may be set up where the Minister of Labour is persuaded after inquiry that the degree of union organization is low and that the wages paid are below a

reasonable level. Extensions of the law will tend in the direction of including more of the unorganized, and more specially the women's, trades under such Boards.

The Trade Board set up in any industry contains an equal number of employers' and workers' representatives, with three members appointed by the Minister of Labour, one of whom is the Chairman of the Board. It is its function to fix the minimum time rates, and, where necessary, the minimum piece rates to be paid to reasonably efficient workers. When these rates have received the sanction of the Minister of Labour, they are promulgated by advertisement in the *Labour Gazette*, and by printed notices, one copy at least of which must be kept posted in the workrooms within sight of the employees concerned. Moreover, the employer must keep a record of the earnings of all employees covered by the Trade Board in a form sufficient to demonstrate to a Trade Board Inspector that the regulations have been obeyed. All time workers must be paid not less than the hourly rate, while the normally efficient pieceworker must be able to earn the hourly piece earnings fixed by the Board. The general principle governing the adequacy of piece rates is that they must afford the normal worker an opportunity of earning the statutory minimum. The Trade Board regulations contain provision for the fixing of a lower time rate for persons incapacitated in any way, and thus unable to earn the minimum. A permit must be obtained in such circumstances, and the rate of pay named in the permit strictly adhered to.

Trade Union Negotiations.

In a more significant proportion of factories, wage rates are settled by union negotiations, either directly between the employer and trade union officials or between unions and employers' associations to which the individual employer belongs. These may be trade associations, like the Boot and Shoe Federation and the Engineering

Employers' Federation, or Joint Industrial Councils and Committees. Obviously, an employer in any other of these types of association may have employees from other trades or occupations whose wages will not be governed by his association. In such an event, and where these employees belong to their appropriate union, he will have no other course open to him except to pay the standard rates of that union. He may do this voluntarily or by request of the union officials. Where the employees do not belong to any union, he is free, theoretically, to pay them any sum for which they will consent to work, though in practice he will be compelled to pay a rate comparable to the earnings of men doing work of equal skill and intensity. Unless he does this, his employees will tend to pass into the better paid occupations.

This pressure towards a level standard of wages may be counteracted by several forces, such as unemployment or surplus labour, domestic necessities and unfavourable geographical location, but the well-organized business always takes it into account. The employer should know what are the standard rates in each trade or occupation he employs, and the extent to which he is paying these rates. To this end, he should watch movements in wage rates as set out in official publications like the *Labour Gazette*, or in the more responsible of the daily papers.

Forms of Wage Payment.

The employer anxious to organize his wage arrangements in the more satisfactory way will give some thought and attention to the different forms of wage payment. These are of three main types, time wages, piece wages, and different forms of bonus. Time wages are strictly rates of pay expressed in pence per hour or shillings per week of a standard number of hours, and are independent of any relation to rate or quantity of output. Piece rates represent the most detailed form of payment by results, being individual rates for specific units of production. Most

forms of bonus combine in some degree the characteristics of both types of payment, being based on time rates and offering payment by results in the shape of extra remuneration for extra output, whether expressed in quantity, as in a production bonus, or in time saved, as in a premium bonus system. The more specific characteristics and the advantages and disadvantages of these three types of wage payment should be considered.

Time Rates.

Time rates give the worker a known and calculable wage, which is more regular than he would obtain under any form of payment by results. At the same time, it gives the employer a stable and calculable total labour cost. It has an advantage also in that it is comparatively inexpensive and simple to calculate. The only record needed is the number of hours that the employee has been on the job. A simple calculation suffices to arrive at the total amount to be paid in each instance by the cashier or the wage office. Further, where quality is specially important or the material worked upon is especially costly, these rates are relatively less wasteful and to that extent cheaper.

The disadvantages of time rates should, however, receive careful attention. They fail to supply any intrinsic incentive to greater effort or harder work. There is no additional reward for effort greater than the customary "stint," and no inducement to work faster than the pace which the overlooker will tolerate. Consequently, the employer is compelled to rely upon the driving power of his foremen or the fear of unemployment to obtain an output necessary for him to balance his cost of production with the prices he can obtain upon the market.

This absence of additional reward for additional effort is felt to be unjust by the worker of superior skill or energy, who tends to reply by reducing his rate of output to the level of the average worker, or, more frequently, to that

of the slowest. There results an unnatural degree of uniformity of output which tends to increase costs.

Prima facie, there is no reason why the worker possessing superior skill and energy should not receive more than the minimum time rate. He is worth more, always assuming that he gives the extra marginal effort or skill of which he is capable. Whilst accurate measurement of this margin is difficult, a reasonable and equitable payment for the extra skill or energy is not impossible. By careful analysis of the jobs on which men possessing these qualities are employed, or by a rough time study, a system of graded time rates can be worked out, even where payment by results is impossible. The gravest difficulty in these matters is the attitude of the trade unions in certain trades, which have come to insist on standard rates and dislike any departure therefrom.

Piece Rates.

The piece-rate system pre-supposes that output increases in direct proportion to the effort of the workers, other conditions remaining identical. It is most easily applicable to conditions where work is standardized and processes repeated. Though not impossible in other circumstances, it is most successful where a large quantity of output is desired, where inspection of large quantities is easy, and where the quality of the work can be determined by some person other than the worker, or by some mechanical contrivance. It is not applicable where the work is non-standardized, non-repetitive and difficult to measure, as in maintenance and repair work and most types of agricultural and clerical work, which usually remain on time rates. Moreover, it offers the wrong type of incentive where delicate machinery necessitates special care. Again, where material is valuable, waste resulting from the greater speed shown in piece-rate production may exceed in cost whatever is gained in extra output. In leather-cutting or tailoring, for example, a man may easily waste several times his daily

wage, a state of affairs not remedied by the usual practice of employers in paying only for work which passes several inspection tests.

Advantages of the System.

The piece-rate system of payment is simple and easily understood. Though it involves the recording of output and detailed calculations in order to arrive at total daily or weekly earnings, the extra clerical expense is not great and is well worth while. Under ideal conditions, it is unsurpassable for equity and economy. It offers workers the most satisfactory form of financial incentive, since increased effort is directly rewarded. It gives greater satisfaction to more skilful or more diligent workers, and incites slower or less skilful persons to work harder. It is relatively less costly than time rates, since supervision costs are reduced, workers on piece rates tending to be their own supervisors. Moreover, the greater output carries the burden of overhead costs with more ease, and unit production costs are reduced.

Disadvantages.

The disadvantages of the piece-rate system of payment, which are not inconsiderable, may be summed up under six heads—

1. It is fundamentally difficult to find a fair output basis for the fixing of piece rates. Most trades have arrangements that the earnings of efficient or reasonably skilled piece-workers shall be one-quarter or one-third greater than time rates. This requirement compels an effort to discover what output can normally or reasonably be given. In most cases, any such effort begins a struggle between the workers and the management, the former having an obvious interest in having this quantum set as low as is feasible. The management, no matter how honest or just, is faced with difficulties. If the work to be paid by piece rates has previously been done on day rates, the

output then given is an imperfect measure of what will or can be given on piece rates. If the job or process is new, the output that will be given by a practised worker is not known to anyone.

2. Partly on account of this difficulty and because of differences in human nature and individual capacity, payment on piece rates leads to diversity of earnings. Some earnings tend to become too low to allow of a reasonable standard of life, while some are high, thereby causing dissatisfaction and a sense of unfairness. The jobs which yield high earnings come to be sought after and those which yield low earnings are disliked. In consequence, the organization of production is hampered and supervision and control become more difficult. This position is made worse if attention is not given to the remuneration of overlookers who will be dissatisfied if paid less than some of the workers they supervise.

3. The lowering of any rates initially fixed too high is generally regarded as dishonest by the workers, who retaliate by restriction of output to avoid such contingencies. One evil thus leads to another, costs of production remaining high under either alternative.

4. Without readjustment, the advantages accruing from improvements in methods of production and organization, initiated often at great expense on the part of the employer, tend to pass almost entirely to the workers. Such a result is both unfair and uneconomic. Piece rates stultify themselves unless an easy and agreed basis for readjustment is available in such circumstances.

5. It is difficult, under a piecework system, to make the modifications in payment necessary in order to meet conditions beyond the operator's control, e.g. failure of power, breakdown of machines, the supply of unsatisfactory material. Equitable adjustments in such circumstances place a strain upon the intelligence and sense of fairness of the supervisory staff, who penalize themselves for the failures of management in any concession they make.

6. Since payment under piece rates is proportional to output, speed and quantity of production are given precedence over quality, which tends to sink as low as the inspector or examiner will allow it. In such industries as engineering, where standards are measurable, it is not so difficult to check a departure from standard as in other trades like textile, printing, tobacco, glove-making, or confectionery. But in whatever trade piece work may be instituted, it is indubitable that it lessens the sense and significance of craftsmanship.

Foremost among the weak points in the system must be put the cutting of piece rates. By this is usually implied the arbitrary raising of the amount of output required for a standard sum of money, primarily because the workers have shown that they can give an output greater than the figure originally fixed. It is true that the term is applied to all adjustments of piece rates, but fair-minded workers are ready to join with practical wage fixers in agreeing that certain conditions demand and justify adjustments. It is not only uneconomical, but also unfair to retain the same piece rates when costly changes in organization or in mechanical equipment have automatically resulted in an increased output from each individual, or in some other way made an increase in output possible without further effort on the workers' part. Moreover, when a demonstrable error has occurred in the setting of a rate, so that earnings thereon are either too low or too high, it is quixotically foolish to allow this error to persist without readjustment.

Nevertheless, it is desirable to avoid the "cutting" or readjustment of piece rates, no matter how necessary. The fear of such action is one of the most effective deterrents of energetic activity and of co-operation between labour and management. Consequently, it is of the greatest utility and importance to find a just and economical basis of output. Here, a double difficulty is met, the first one mechanical, the second psychological. The former is to determine

accurately the physical output, without causing over-strain, or inducing "ca' canny." The latter is to satisfy the workers that the output standard fixed is fair both to themselves and their fellows.

The determination of output can be done by one of two methods. The older and, in many businesses, the current method, is for the overlooker to guess at the amount of output that can be expected from a reasonably efficient worker and to fix a rate that would yield some conventional wage. A slightly improved form of this method involves a certain amount of bargaining upon the output standard, the workers' views to this extent being considered. The more scientific method is to set rates by time and motion studies. All the conditions that enter into or affect production can thereby be taken into account. The effect of unfavourable conditions which occur inevitably and regularly to limit production can be measured, and any which are the fault of management can be discovered and remedied. By the application of motion study, the easiest and most productive methods can be established.

The difficulty of persuading the workers that the output asked is fair is a problem to be solved mainly through consultation and conference. Unfortunately, in the fixing of wage rates, the interests of employer and workers seem to be inherently opposed. The utmost efforts to obtain a just conclusion will not be self-evidently fair. Even where a long record has demonstrated an intention to be fair, each new job revives the conflicting interest. To find a way out of this difficulty is not easy. It is important, in the first place, to assure workers that no arbitrary action will be taken. This can best be done by setting up a piece-rate committee, or by providing some other machinery for representative discussion, as is found in the Nottingham lace trade and the cotton mills of Lancashire. By this means, information can be given, the agreement of representatives of the workers obtained, and mutual confidence strengthened. Without definite efforts in this

direction, employers must expect to face suspicion and criticism.

Another weakness of the piece-rate system is one that is being gradually removed. Piece rates lose much of their value as incentive unless they normally yield more than time rates and unless minimum time rates are guaranteed. Clearly, if the output of piece-workers is lowered by conditions beyond their control, such as hard material, or by faulty management, the workers will, without this guarantee, bear the whole of the loss. The need for such a guarantee is now fairly widely recognized. Trade Boards set a minimum hourly rate, and most trade union agreements concerning wages stipulate for the payment of time rates as the minimum remuneration where piece rates obtain. Further, Trade Boards set a piece-work basis that is from 15 to 20 per cent above minimum time rates. Many of the Whitley Councils, in their agreements, arrange that piece rates shall be set so as to enable the worker of average ability to earn at least 25 per cent above time rates. Some of the engineering and other trades have a similar provision with 30 per cent as the corresponding figure. A few wage agreements make provision for a minimum payment in cases where forces outside the control of both management and workers, as, for example, the breakdown of power and machinery, or hot and humid weather, hinder production. In the agreement signed under the Interim Industrial Reconstruction Committee in the Chocolate and Confectionery Trades, it is stipulated that time thus lost shall be paid at not less than an agreed figure, which is fixed at about two-thirds of time rates.

Despite all its defects, the method of payment by results in some form or another stands supreme among wage systems. The principle satisfies an inherent sense of justice. It is fair that those who expend more efforts and more energy should reap a proportionate return. Further, its appeal is psychological. Most workers have within them reserves of energy which a good rate of payment unlocks.

Even where work is uncongenial, reasonable remuneration makes it less burdensome, not directly, but by reason of the ultimate satisfactions which the money will command. It is not only our acquisitive instincts, but all our desires for expression and self-realization that are affected by the hope of a greater financial reward. There is nothing sordid about the desire to earn larger wages, since these can ultimately be transmuted into a richer and fuller standard of life.

Bonus Systems.

Bonus systems are only another form of payment by results. They differ from piece rates in that they are a payment for work done or time saved over and above a standard performance, for which the standard wage is paid. In other words, the standard wage is the basis, and the bonus is an additional payment. For the determination of the rates which will yield a bonus it is necessary to calculate the standard performance for which the standard time rates are an equitable payment. In principle, this is identical with the setting of a piece rate, and is subject to all the conditions which tend to make a piece rate just or unjust. But in practice, bonus systems differ in that they are substitutes under circumstances where satisfactory piece-rate systems cannot be introduced. A bonus may differ from a piece rate, also, in the scale of remuneration offered. In the latter instance, each unit of effort or time is equally rewarded. In a bonus rate, it is customary for the employer and the worker to share in some agreed proportion in the time saved or in the cost reduction, so that each unit produced above the standard performance bears a lower cost than each unit of the standard performance. The consequence is that bonus rates lead to a declining cost of production. For this reason they are welcome to employers, but, since the decline in costs is due to a reduction in earnings per unit of increased effort, and because they lend themselves to the same type of unfair

adjustments as piece rates do, they are, in some trades and in certain circumstances, somewhat disliked by workers.

This discussion should have shown that there is no one best form of wage payment. Under certain conditions, time rates may be the most convenient and practicable form of payment. In a small factory, where supervision is easy, and where co-operation springs readily from more intimate personal contact, it may be best to adopt this form of wage, though care should be taken to grade jobs and pay more where greater responsibility or skill is required. In such factories, or in other places or conditions, where day rates have prevailed, higher output can be obtained and the beginnings of a piece-rate system laid by instituting some form of bonus. An employer, feeling his way towards a system of payment by results, can best test his schemes by devising bonuses. Some ingenuity is needed, as well as some acquaintance with costing and with the diverse varieties of bonus systems. Inquiries from other firms will always prove helpful, and general criticisms of any project can invariably be obtained.

The conversion of a bonus system into a piece-rate is easy, provided that a fair output basis has been obtained. This output must be paid at such a rate per unit as to produce the piece standard in the normal week. The installation of piece work, however, begins to call for a larger clerical staff, and sometimes for specific rate-setters. A large factory invariably has to provide a considerable clerical force to calculate and pay its wages, and this staff is larger where piece rates prevail. Moreover, such a factory finds necessary a definite wages section that devotes the whole of its time to the fixing, adjusting and watching of piece rates. In the workrooms, too, checkers are required to record the quantities of work done and pass these records into the offices for calculation. Unless care is taken to organize wage recording, fixing and calculation, increased clerical costs may offset the advantages of payment by results.

The Measure of a Fair Wage.

The adequacy and sufficiency of the wages paid will be a matter of concern to all right-thinking employers. The measure of adequacy is not easy to formulate. In practice, several measures are used, no one of which is sufficient in itself.

1. The statutory regulations of the Trade Board or the terms of a trade union agreement will indicate the minimum that an employer bound by either may pay.

2. The competition for labour with other employers bound by such regulations or agreements, or in other ways competing for a similar class of labour, will determine the minimum that an employer must pay who is not a party to such agreements.

3. Comparison with earnings in trades comparable in respect of skill or profit-making capacity will furnish a measure by which to judge average earnings. On the assumption that an industry or firm should pay in wages all it can afford to pay, such a comparison presents an ideal at which to aim or a demonstration of achievement.

4. More practical help can be obtained from an efficient costing system which will analyse out all classes of costs and reveal some of the more wasteful forms of wage expenditure. In many instances, rates and earnings are low because the amount of indirectly productive labour has been allowed to grow. To the well-informed employer, it is the total size of his wage bill that matters. He can afford to divide the same amount among a smaller work force, and can achieve a better and more worthy result by inciting his employees to greater effort and higher earnings.

The measures to be taken to increase earnings will receive consideration later. In addition to payment by results, they include such psychological factors as incentives, both monetary and non-financial, and methods of administration and organization. Suffice it to record the generally

accepted truth that high earnings, full output and lowered costs, are intimately connected.

(c) HOURS

Hours of employment are regulated by the Factory and Workshop Act, 1901, which places no restrictions upon the hours of employment of men, but regulates the hours of women and of boys and girls between thirteen and eighteen years of age. The restrictions enforced by this Act are as follows—

1. The maximum permissible weekly hours for women, boys, and girls is sixty (60).
2. Sunday labour is forbidden for them.
3. Night work is forbidden for women and girls, but is allowed for boys over 14 years of age in such trades as blast furnaces and iron mills.
4. No woman, boy or girl may be employed continuously for more than five hours without a meal interval of at least one half-hour.
5. Women, but not boys and girls, may be employed in certain industries for two hours' overtime beyond the ordinary daily hours (which are not to exceed $10\frac{1}{2}$) on any day except Saturday, but not for more than three days in any one week, or 30 days in any one year.

Though the legally permissible hours of employment for women and young persons are as high as sixty (60), in practice, even before the war, hours were substantially below the stated limits. At the present time (1927) this is even more true. The close of the war saw a determined effort on the part of the workers to secure a shorter week. Trades like engineering and shipbuilding, which had worked a 54-hour week, by negotiation with employers obtained a 47-hour week. In practically every trade reductions in hours took place, so that the working week which, before the war, was approximately 54 hours, by the middle of 1919 had become 48 hours or less. The following list sets forth typical trades that have adopted 48, 47, and 44 hours

respectively. With regard to the lower limit, it sometimes happens, as in the confectionery trades, that certain of the bigger firms in the trade work 44 hours, while the others work 47 or 48 hours. In other industries, piece workers follow the shorter hours, day workers the longer hours.

48 HOURS

Iron and steel.	Cotton and wool.
Tramways.	Breweries.
Omnibus drivers.	Tobacco.
Boot and shoe.	Printing.
Hosiery.	Railways.

47 HOURS

Public utility services (day workers).	Chemical workers (day workers).
Furniture makers.	Match makers.
Rubber.	Metal trades.
Flour milling (day workers).	Electric installations.

44 HOURS

Engineers and foremen in cold storage plants.	Pottery makers.
Plumbers.	Confectionery workers (large firms).
Dock labourers.	Paper makers (shift workers in three-shift mills).
Flour milling (shift workers).	

The distribution of these agreed hours is affected by the general practice to close down on Saturday not later than noon. In all instances, except those where 44 hours are worked, this necessitates a working day longer than 8 hours. In such cases, the allocation of the working hours over the week has often been the subject of mutual agreement between the workers and the management. In some instances, a clear Saturday has been obtained. At an establishment where the workers were allowed to vote upon the allocation of the hours of a 44-hour week over the various days, the decision was to work only 5 days, two days of 8½ hours, and three of 9 hours. It was discovered that a free Saturday was highly prized, and experience has only confirmed this liking for a "long week-end." Few persons outside the class of manual labourers realize how highly these workers prize increased leisure.

Proper Length of the Working Week.

Nevertheless, the question must be faced as to what is the most desirable length for the working week. Three considerations operate to give guidance towards the answer.

1. Hours of work should not be so long as to prejudice health and well-being. This principle has governed the legislation on the subject.

2. Since leisure and recreation have important physical and social values, the hours of work should not deprive workers of such opportunities.

3. Reduction in hours must stop at the point below which the national volume of production or the national dividend would be adversely affected.

Wages are paid out of wealth produced, and social and humanitarian considerations must cease if shortened hours reduce the sum total of wealth produced below the point necessary to enable adequate wages to be paid.¹ Experience seems to point to 48 hours as the proper length of the working week under present circumstances. Any departure from this standard should be examined and criticized in the light of the three considerations just advanced.²

Lunch Breaks.

Many firms have tried experiments in the direction of reducing the physical strain of the normal week by allowing certain breaks in the course of the morning and afternoon. More frequently these are confined to women workers, though some firms allow men to smoke, or, as an alternative, allow smoking at work.³ It must be remembered that female employees, who leave home early to start work in the factory at 7.30 a.m., very frequently come away without a substantial breakfast. Late rising or the more numerous items of detail to which a woman has to give attention, cut

¹ Cf. B. Seebohm Rowntree, *Industrial Unrest*, p. 20.

² Cf. *idem*, *The Human Factor in Business*, p. 18.

³ Messrs. Hans Renold allow men to smoke in their engineering workshops.

into the breakfast interval. Experience among factory girls shows that quite a significant proportion have not eaten enough breakfast to enable them to keep at work until the mid-day meal. Further, the five hours which normally comprise the morning spell constitute a long stretch, a break in which has psychological as well as physical value.

Consequently, many firms, more particularly those employing girls, allow a short break of ten to fifteen minutes in the course of the morning, usually round about 10 o'clock. Girls may eat any lunch they have brought with them, and facilities are usually provided for the supply of some warm drink. Some firms give similar facilities in the afternoon spell, especially when girls are likely to be required to work until 6 o'clock.

Overtime.

Overtime is definitely related to hours of employment, and is calculated daily or weekly. Arrangements concerning overtime usually stipulate that it begins each day after the normal day has been worked, though circumstances arise where the normal week must have been worked before overtime can begin. Since overtime working is a contradiction of the move towards shorter hours and greater leisure, it is penalized ordinarily to the extent of payment at 25 per cent advance for the first two hours, 50 per cent thereafter, and more especially for Saturday afternoon work, with double rates for Sunday work. These advanced rates of pay do not tend to render overtime generally acceptable, though little difficulty is experienced in getting men and women to "work over" where the necessity is obvious or has been explained. There is a growing tendency in industry to acknowledge the right to leisure. This has led overtime working to become a matter of agreement rather than of order. A measure of attention is given to personal convenience so far as is consistent with workroom organization.

In any factory, whether small or large, the records of overtime worked should be carefully scrutinized. Work done in overtime is costly. It is paid for at an increased rate. If following a full day's work it will be done by somewhat tired and exhausted men. Quantity and quality will, therefore, be lower and cost higher. Moreover, regular overtime working is not unavoidable. Better organization or more adequate staffing will do much to remove it. Especially should the record of any overlooker be watched where it is shown that he and his men systematically work overtime. Either his organization or his staffing is wrong. In most cases, it is desirable to disconnect the remuneration of overlookers from time payment, putting them upon some form of salary, so that they have no pecuniary interest in working beyond the factory hours. Even when this has been done, there will still remain foremen who measure their loyalty and their efficiency by the number of hours they spend upon the factory premises. In such cases, instruction is needed in the better organization of their own time and that of the men they supervise.

Short Time.

During the last few years of depression, most factories in Great Britain have experienced varying degrees of short time, rendered unavoidable by bad trade. Obviously, this entails loss to all concerned, and the situation is not eased if one department of a business is on short time while another is on overtime. Common sense and economy both suggest that the staff of the latter department should be augmented, probably only temporarily, from other departments, so as to lessen and, so far as possible, equalize the burden. More fundamental is attention to the steadiness and regularity of manufacturing policy by which both overtime and short time may be reduced. Incidentally, it is an advantage to the workers to organize short time in such a way as to make it possible for them to conform to State regulations and thus secure unemployment pay during

the period they are off. This necessitates knowledge of the conditions under which the worker may qualify for State unemployment pay.

(d) WORKING CONDITIONS

Holidays.

In intimate connection with the question of hours of work is that of holidays. It is increasingly becoming the custom for employers to grant at least a week's holiday, in addition to the customary holidays, and to pay wages for them. In most instances, a qualifying period of 12 months' service is required before such a holiday is granted. In a number of cases, a shorter holiday is granted to persons whose length of service has not qualified them for the full holiday, and persons leaving between one holiday and the next receive payment in a similar proportion. In some trades, like the textiles, where the employers do not pay for holidays, the workers save up their earnings throughout the year by regular voluntary subscriptions to a holiday fund. In the boot and shoe trade, a holiday fund is built up by joint contributions from the employer and the worker. These contributions are paid in for 48 weeks, and are withdrawn in two smaller instalments at Easter and Whitsun and two larger instalments at August and Christmas. The typefounders of London build up a holiday fund by working two extra hours for each of 50 weeks, the payment of which accumulates as a holiday fund.

The justification for granting a holiday for workers is identical with that operating in respect of holidays for clerks and others. Though, unfortunately for the peace and comfort of executives, holidays can only with difficulty be dissociated from status and prestige, the day has gone by when the absence of a paid holiday can legitimately be regarded as that which differentiates a manual worker from any other worker. A fuller knowledge of monotony, fatigue, and strain has laid a psychological and physiological

basis for what was a few years ago regarded as purely a "welfare" matter. Manual workers return from a holiday in better physical trim, and the placing of the holiday week at the close of the summer and the beginning of the autumn season is sound and wise.

Health.

Healthy and contented workers are an asset to industry }
 It is this admittedly common-sense fact which justifies
 "welfare work." By reason of their psychological make
 up, men and women are responsive to their environment,
 whether material or personal. Industry, which during
 150 years in Great Britain has been drab and uncomfortable,
 has neglected this elementary fact and, while desiring skill,
 imagination and verve, has until recently done nothing to
 supply an environment consonant thereto. The economic
 justification for welfare work is that it is good business.
 Unfortunately, its results cannot be demonstrated in
 tangible contributions to the profit side of the ledger, since
 the only true comparison must be with conditions as they
 would have been if welfare work had not been carried on.
 Welfare work can scarcely be a controlled experiment.
 It destroys much of the evidence for its justification in the
 course of its operation. No firm where welfare work has
 been carried on for 8 or 10 years can, with any approach
 to verisimilitude, sketch what would have been the attitude
 of the workers and the general tone and temper of the
 establishment if the experiment had not been made. It is
 their conception of business and of the right way to carry
 it on that has dictated the introduction of welfare work.
 To them, business can only be conducted soundly and
 without danger of subversion if due regard is paid to the
 health, welfare, comfort and desires of the employees.

Foremost among welfare activities must be placed care }
 for health. Illness reveals itself in broken time which is
 a loss to the individual and to the firm. Team work is
 disorganized and planning arrangements upset. The

worker is subject to anxiety and a measure of deprivation that is not fully realized by the more fortunate. But the most sympathetic and understanding employer may well ask how this may be averted without incurring an unreasonable and inexcusable cost. In a small factory, the overlookers might be encouraged to give some attention to the matter, though, obviously, they can do little to give direct help, except by sending sick employees to the appropriate panel doctor. Direct help comes by the introduction of professional workers, possibly a nurse in the first instance. There is much that a nurse can do in the direction of giving attention and advice, and, in most circumstances, she can soon obtain medical assistance. In a larger factory, a doctor can profitably be brought in for certain hours in the morning, and, with assistance from a nurse, can deal with the numerous minor cuts, accidents, etc., that partially incapacitate workers and restrict production. Most factories that have started in this way have discovered that the medical service is its own justification. As workers develop confidence in the medical staff and learn from experience of the value of prompt attention to even minor ailments, the attendance at the surgery grows, while absence due to illness decreases. The employer finds that there is work for one or more full-time doctors.

Wherever a doctor is installed, it is desirable that he should examine all applicants for employment. This is obviously the first step in medical care, which is largely governed by the history of the case. Where employees are weakly, or ailing, judgment can be shown in the selection of jobs, and arrangements made for periodical examination and advice. Two considerations make this important—

1. Normally, juniors enter industry direct from elementary school, at the age of 14 years or thereabouts. During the next two or three years, significant physical and mental changes are occurring, and it is especially important, in the case of girls, to watch that these do not combine with the normal strain of industry to weaken health and stamina.

The best social thought of the age is in protest against the effects of industrial life upon physical and mental developments at these significant years. Industrial wisdom consists in doing all that is possible to build up a healthy work force, and juniors need attention.

2. While a selected work force is in some respects a desirable ideal, it is arguable whether it represents a sound social policy. The factory is, to a certain degree, a microcosm, reflecting the larger world, in which the strong and the weak, the vigorous and the lethargic, alike find a place. It is asserted that the effects of selection wear off in a few years, so that at any one time a work force will comprise a number of men and women unequally fitted for the physical strain of their jobs. Medical examination furnishes the data on which to correct this inequality by fitting the weaker man to a lighter job, and the stronger man or woman to the heavier job. Deterioration in health can be remedied by changes in occupation, or by other specific measures.

(e) PSYCHOLOGY IN INDUSTRY

Of recent years much attention has come to be directed to those aspects of the life of the individual worker that are more characteristically human. The application of psychology to the problems and perplexities of industry has thrown a good deal of light upon them. Fortunately, much psychology is organized common sense. The thoughtful overlooker or the well-informed manager will have enough knowledge and insight to enable him to find his way through many of these difficulties. Whether in a large or in a small factory, it is desirable that all such representatives of the management should think in psychological terms, and should direct and control with due attention to attitudes, feelings, impulses, and emotions. In larger factories, where the problems are more numerous and more intense, it will probably become necessary to have a specialist giving full attention to these matters, whether it be an employment manager whose concern is the more general

attitudes of the employees towards the firm and their work, or a technically trained psychologist, applying his knowledge to specific individual problems. Inability to introduce either or both these experts is, however, no justification for neglecting to consider the psychological aspects of industry.

Psychological Problems.

The psychological problems of industry appear to fall into three classes—

1. The selection of the worker, his fitness for the job, his intelligence and his character.
2. Problems of the work, its fatigue, monotony, etc.
3. The adjustment of the worker to his work, considered both specifically and generally.

The selection of the worker is the initial problem and conditions the remainder. The adjustment of the work will involve consideration of the best way in which the work can be done, and implies motion study. The adjustment of workers in general to industrial life raises the large issue of democratic joint control.

The Worker's Fitness.

The fitness of the worker for his job depends upon a variety of innate characteristics. Probably no one has yet scheduled all human characteristics which affect suitability for employment, and there is no greater exactness about our knowledge of what qualifies an individual for a specific job. Certain general qualities can, however, be postulated. Skill, intelligence, temperament and character regulate the degree of fitness for employment. A particular type of skill is the differentiating qualification for a particular occupation. Intelligence makes for a wider area of choice and for the assumption of larger responsibilities. Temperament and character are limiting factors in respect of responsibility.

Knowledge of the significance of these characteristics demonstrates the necessity for ascertaining and measuring

them. Admittedly they are not easy to detect, and, therefore, not easy to measure. The unaided judgment of overlooker or manager may go far astray. Nevertheless, in the small business these officials should do what they can to fit the worker to his job. In so doing they involuntarily adopt the method known as trial and error. An individual is put to do a job ; if he carries the work through to satisfaction, he has justified his appointment. By testing him upon one job after another, some measure of his intelligence and adaptability can be obtained, while temperament and character become known in the daily and more intimate contacts possible in a small establishment. A small, keen, and well-organized business can do a great deal in this direction without expert assistance, provided that those who control it keep two points in mind—

1. An individual in a post for which he is not fitted is a nuisance to himself and a loss to the company. Misfits produce friction, and friction is wasteful and costly.

2. All appointments should be considered in the light of what they may lead to. An overlooker selecting a worker for an ordinary manual post will lay chief stress on skill and capacity. But a manager selecting for a sub-administrative post that occupies a definite place in the ladder of promotion will, if he is wise, consider intelligence, temperament, and character. He should select men whom he would promote, if the opportunity arose.

Vocational Tests.

The measurement of the inherent qualities which determine vocational fitness is, however, mainly a matter for psychological investigation, and, in a larger business, should be conducted on systematic and scientific lines. In some instances, firms have attached a psychologist to their staff. In other cases, they have secured advice from an association like the National Institute of Industrial Psychology, which has devised tests of intelligence and vocational fitness to be applied by the employment officers

of the firm. Other firms, relying upon the skill and knowledge of their own employment staff, who may not have had any psychological training, have themselves devised or copied intelligence and vocational tests that they use in the same way.

Within the limits of this text it would be impossible adequately to describe these applications of psychology to industry. Intelligence tests are very fully described in the various manuals of psychology, and may, acting under advice given in these manuals, be adapted to the needs of any particular establishment.¹ Vocational tests must be more specific in nature, and related to the needs of the firm and the nature of its processes. They ought to be drawn up by persons with psychological experience, who should conduct and appraise them.

The Effect of the Work upon the Worker.

The problem of the work in its effects upon the individual has received more prominence. Monotony and fatigue have been much discussed, though far from the last word has been spoken on either of them. Monotony is an emotional attitude towards a regular and frequently repeated rhythm. Experience has shown that the emotional attitude of persons of higher intelligence, with its accompanying characteristics, is one of great tension. They find themselves disturbed and profoundly "bored." On the other hand, frequent and continuous repetition of some rhythmical movement is not disturbing, even if not quite satisfying, to other persons of lower intellectual calibre. Monotony is, therefore, a relative and individual matter, and the presence or absence of disturbing effects is definitely correlated, both positively and negatively, with certain intellectual levels. Proper vocational selection can do much to remove the effects of monotony by relegating to repetitive jobs those who will experience little emotional

¹ See e.g. Drever, *Psychology of Industry*.

reaction thereto, and removing therefrom those whose emotional states are accentuated.

Fatigue is one of the subjects to which industrial psychology first gave attention. In part, it is a subjective feeling of tiredness, and, in part, "a state of lowered efficiency of the organism shown by diminished output."¹ Obviously, fatigue is natural and normal in industry. Fortunately, however, it is relative and is subject to diminution and elimination by rest. There is a healthy degree of fatigue experienced by any one who has done a satisfactory day's work, without undue strain or too long hours. The healthy nature of this degree of fatigue is proved by the way in which a normal night's sleep leaves the individual refreshed for another day of physical or mental labour. There is also an unhealthy degree of fatigue in which the waste products generated by muscular activity accumulate in the organism and are spread over the system by the blood, producing serious restrictions upon nervous and muscular energy.

Rest Pauses.

Time is the essence of the matter in fatigue. Muscles and nerves, if continuously exercised, rapidly become fatigued. Workers kept continually busy will tire quickly, and their diminished physical efficiency will manifest itself in reduced output. Since, however, the degree of fatigue depends upon the amount of rest and recuperation available, a proper arrangement of work and rest periods will do much to remove its worst effects. This fact has now been recognized, and some experiments made in so arranging periods of rest as to afford a real opportunity for recuperation.

These may be roughly divided into two classes—

1. Opportunities afforded to workers, more especially girls, to stop during either or both morning and afternoon,

¹ Cf. Collins and Drever, *Experimental Psychology*, p. 166.

generally to eat and drink. So far as the purpose of such pauses is eating and drinking, they are scarcely governed by psychological considerations, and have accordingly been described earlier under the heading of hours.¹ But such a rest-pause must necessarily have psychological and physiological reactions. It will allow tired muscles and nerves to recuperate and should yield compensating results in output. When this pause occurs half-way through the morning or afternoon, it would seem to be rightly placed. The only thing to be said against it is that it breaks up the natural swing of work, requiring another period of "warming up." Observation tends, however, to show that the arranged period of the rest-pause is not preceded by any slowing-up of effort, like that shown to be associated with the mid-day pause after a full morning's work, nor is the period of "warming-up" a very protracted one. These rest pauses would seem to have a distinct psychological justification.

2. Organized rest pauses, introduced systematically into the day's work and involving a compulsory rest of a certain duration. The justification for the length and frequency of such organized pauses must be found not so much in psychological theory or physiological facts as in their effects. The human organism or machine passes through several phases in its functioning. These are: (a) "warming up"; (b) "settling down" into a rhythm which is governed primarily by personal factors but secondarily by practice; (c) "slacking off," the result of the oncoming of fatigue. Organized rest pauses must be long enough and frequent enough to overcome the effects of fatigue without increasing the lost time involved in "warming up," or reducing the rhythm and pace of the period of settlement. Experiments will be needed to determine what is the right length and right frequency of rest pauses, and this should be done under psychological guidance. Incautious and misguided experiments of this kind are likely to be costly.

¹ See earlier, p. 129.

Adjustment of the Worker.

The adjustment of the worker to his work is both an individual and a general problem. The individual worker furnishes a problem in training. The worker in general, or the working class, constitutes a problem in group psychology. On its specific side, work is a process or job, for which there is "the one best way," which all workers should attempt in order to realize the best results. On its general side, work connotes the whole of industrial life, the problems of which constitute the difficulties of adjustment felt by the individual and the industrial group. Consideration of this general aspect introduces most of the vexed problems of labour relations.

Training.

Training is an organized method for adjusting the worker to his work, and is closely connected with that analysis of the job which is known as time and motion study. It is now being recognized that by definite and systematic teaching, most workers can be introduced quickly to a knowledge of the processes of industry. An understanding of the learning process and a knowledge of the industrial process form the basis on which the trainer or teacher works. Though some special training as a teacher is desirable, it is not essential. Any intelligent and thoughtful overlooker, who is ready to think out a mode of approach to a new job, or for a new person to an old job, can do a great deal in this direction. In most factories, this work must be left to overlookers. Seldom is it desirable to leave other workers to train juniors. Though the older worker is competent and willing to give the junior considerable instruction, he cannot teach better than he knows. If he is a piece-worker, he will, at least in the early stages, lose upon his earnings. No matter what arrangement may be made, such a person is doing the work of the management, and doing it with less foresight and judgment than is available.

Motion Study.

There is a general tendency to bring expert analysis of the job to the help of the teacher. If the job is to be learnt quickly, it must be reduced to its simplest elements, to fewer and better co-ordinated movements. The first step to this is some degree of dissatisfaction with the present state of things. Grounds for this dissatisfaction present themselves in the inordinate length of time which custom prescribes for the learning of most industrial processes. Candid analysis will show this length of time to be largely a defensive mechanism, born of the insecurity of earnings and employment that have so long characterized British industry. The establishment of this fact is itself of much significance and compels attention to the general philosophy of labour. Returning to the specific problem, once some dissatisfaction is awakened with present circumstances, the human mind is freer to search for a better way. Motion study is an endeavour to find this better way, through excluding useless, wasteful, or ungainly motions, and by the establishment of the shortest and most naturally rhythmic movements.

Here, again, while the expert to whom this work is delegated will be of inestimable value, no establishment should wait upon his appointment before encouraging managers and overlookers to analyse jobs and strive to find the best ways of doing things. The analysis and survey of the various methods used by individuals is a necessary and preliminary step. It will probably be seen that there are small but significant differences in the way individuals carry out the same job. The one whose rhythm is the more suitable will be achieving higher output with the same effort as others, or the same output with less effort. It is almost a maxim in motion study that the worker to copy is the good wage earner who doesn't seem to be working at all. A careful scrutiny of a few picked workers will enable an overlooker to form a rough sketch plan of the best,

easiest, and most direct motions. His next step must be to test these himself, trying out various ways of doing the job, measuring his success by time spent and output obtained. When, by this process of analysis and experiment, an overlooker or a motion-study man has devised a series of motions that are demonstrably faster and less fatiguing than those in use, the next step is to secure their adoption generally by the workers.

This comes back to the trainer. Where such an individual is definitely employed, he should probably be the actual experimenter, under the guidance of the overlooker, and should work up the selected motions into a consistent and related schedule. Having learnt these himself, he is then in a position to teach them to others, and will be able to pass them on without great difficulty to beginners. In the case of older workers, where habits and methods have become set, there will be objections that only tact and perseverance can overcome.

It should be said, however, that in a large factory the work of motion study can profitably occupy the time of one or more persons. The test to be applied to determine whether to appoint the first one, is the ability or otherwise of the normal managerial and administrative staff to attempt the work. The test of the success of the first motion-study man, as of subsequent ones, is whether he has increased the speed and quantity of output, and has reduced the strain of the work. These two results should both be expected. If the first is achieved without the second, the result must be judged unsatisfactory and incomplete. "Motion study aims at eliminating unnecessary and wasteful methods, and instructing the worker in what we might call a 'shorthand method' of working. All useless movements are dispensed with, thereby reducing fatigue, and the most efficient co-ordination of movements is investigated, the aim being to obtain the maximum of work with the minimum of effort on the part of the worker."¹

¹ Collins and Drever, *Experimental Psychology*, p. 175.

If these results have been achieved, motion study has won its place.

Human Relations.

The general aspects of industrial psychology have received less detailed consideration than such specific items as selection, fatigue, and motion study. The psychology of group relations is not so amenable to scientific inquiry and analysis as are the more specific items. Results reached in this field consist of large generalizations based upon experience, reinforced by analysis which is chiefly qualitative in nature. The validity and truthfulness of such generalizations depend upon the nature and extent of the experience upon which they are based, and the penetration and skill displayed in the analysis. By reason of differences in experience and analytical power, individual employers tend to hold diverse views on the attitudes of the labour group and on the best ways of meeting their aspirations and demands.

In consequence, it would be of little use to attempt to add another analysis to those already available.¹ The employer and administrator are concerned with the views of their employees on specific matters, and with devising means of remedying grievances. Our discussion can, therefore, be more helpful if confined to such practical considerations. Nevertheless, it must be asserted that few employers get very far in the practical handling of industrial relations without a complete and sympathetic understanding of points of view that they do not support, and a knowledge of proposed reforms that they can only partially endorse. Further, labour is so inarticulate, and the expression of its aims so biased and imperfect, that sympathetic understanding must be seconded by a willingness at times to become labour's advocate, and state its case.

¹ Much guidance on the psychology of the labour group can be obtained from C. de Lisle Burns' *Industry and Civilisation*.

The first step in this matter is to secure a medium for the expression of grievances and of proposals for their reform. Considerable success has attended the installation of a council representing the whole works, composed as to one-half of members of the administrative staff, and as to the other half, of elected representatives of the workers. This form of representation is suitable for either small or large factories, the larger factory requiring only a larger council, or, if deemed desirable, the separation of the women's council from the men's.¹

The constitution of such a council need not be complex. Election of workers' representatives will be by nomination and ballot, attention being given primarily to the area of representation. Each delegate must effectively represent a distinct group with mutual interests. The management representatives might quite reasonably be nominated by the board of directors, or, in a larger concern, where managers and foremen are differentiated and have formed some type of association, might be elected by the separate associations. It is important to secure to the foremen an effective place in such a council. The objects and purposes of such a council must be clearly understood. These are three in number—

1. To furnish an avenue for the ventilation of grievances. Much discontent is due to small matters that have very little significance, and could easily and satisfactorily be settled, if brought to light. Having remained under the surface, they have become at length a festering sore. The very process of explaining helps the complainant to see the matter in proper perspective, and action can quickly be taken to remedy a grievance that has been reported.

Experience has demonstrated the desirability of limiting the presentation of such grievances to those which are general in nature, and of requiring individual or sectional

¹ See e.g. *A Works Council in Being*, which contains an interesting account of separate men's and women's councils at the Bournville Works of Messrs. Cadbury Bros.

grievances to be submitted first to the overlooker or manager concerned. Unless this is done, the authority and influence of these executives will be diminished, and the time of the council consumed on matters that have no interest to a large proportion of its members. The right of an appeal to the council tends to secure proper attention to the grievance which will not come to the council unless a matter of principle is involved.

2. A medium for explaining the plans, purposes, and policies of the company. The suspicion which permeates modern industry has its origin largely in ignorance. Business and its ways are a *terra incognita* to the average working man. The realities and responsibilities of joint-stock enterprise are to him a closed book. A century and a half of industrial history has left a tradition of suspicion, which itself darkens understanding. Frank, complete, and open explanations of the projects, circumstances, and ideals of a firm are the only antidote to the poison of suspicion. The monthly meetings of a council present many opportunities for such explanations, the value and effect of which are greatly enhanced if the council's minutes are widely circulated throughout the establishment.

3. To offer an opportunity for constructive co-operation between management and labour. Very many firms begin with co-operation on matters of welfare, such as recreation, canteens, libraries, and so forth. Joint committees are set up to direct or foster such activities, which are often subsidized by the firm. In this, there is nothing different from social activities outside the firm, and nothing that resembles constructive steps towards bridging the gap between the two groups known as "capital" and "labour."

Co-operation of this sort has not gone very far and has obvious and definite limits. The demand for "a share in the control of industry" lacks definition and precision. The majority of workers have no clear views on the matter, but the more thoughtful of them are anxious to be consulted in the many matters of daily administration that intimately

affect them, while some are willing to give help in the details of daily work. Joint responsibility for administration of these matters is, in most instances, impossible, and cannot be conceded. But two things have been proved possible in the experience of many firms in the country—

(a) Free interchange of views between the firm and its employees. This may seem but a theoretical advantage. In reality, it is of considerable significance as a step towards co-operation. It implies an atmosphere of trust and understanding. Workers' representatives will only speak fully and unreservedly when they have no fear that their words will be misunderstood, or will lead to injury to themselves or their fellows. A free and full interchange of views is a real step in constructive co-operation.

(b) Joint determination of policy on matters of management intimately related to the workers' capacity, experience and knowledge. Two such matters might be taken in illustration. Time-keeping, with its many regulations and its penalties, is one on which the workers have much knowledge. In company with representatives of the management, competent to give guidance on the reasons behind regulations and penalties, policies can be shaped and rules drawn up for new situations. Dismissals are a subject on which the workers' knowledge is painfully acute, and where the demand for fairness is irrefutable. A joint committee, where the management side is as much moved by justice as by the desire for the efficient conduct of the business, will be able to formulate a policy on this difficult and trying matter. Illustrations can be found in the railway service, and in many individual firms.

This method of joint discussion and consideration of policy can be applied and adapted to a variety of subjects. Some firms have experimented with a piece-rate committee which jointly considers the fixing of piece rates, and decides whether to raise or lower a rate. In others, a joint committee is set up to deal with theft, in such instances the committee having the power to try and punish the offender.

The matters or areas of administration that may become subject to this form of joint determination of policy cannot be named definitely. They must each be considered on their merits, subject to four postulates concerning the workers involved, and, more particularly, those who would sit on the joint committee.

1. The interests of the workers in the matter under discussion must, in the broader sense and in the long run, substantially coincide with those of the employer.

2. The workers concerned have a degree of knowledge adequate for coming to a right decision. It is preferable that they should have this direct. Should it be necessary to obtain such knowledge from technical experts, this must be possible without disadvantage.

3. Their intelligence must be equal to the discussion of the problems and to the weighing and sifting of evidence.

4. Committee men must be obtainable, willing to take responsibility and to act upon their best judgment, even though their decisions will be opposed by the more extreme, or less instructed, of their fellows.

(f) SECURITY

Nowadays, the business man who would organize his factory so as to carry his employees with him, must take account of the demand for security. This shows itself in a desire to be protected against accident, disease, old age, unemployment, and untimely death. The State has done much to meet these five calamities through the Workmen's Compensation Act, Health Insurance, Old Age Pensions, and Unemployment Insurance. Nevertheless, there is much that can and ought to be done by the employer in each of these matters. Accidents can be reduced by safeguarding machinery to the utmost mechanical limit, and by adopting the policies and methods of the "Safety First" movement. Some firms, where accidents are more likely, by reason of the nature of the mechanical equipment, appoint a safety committee among the workers for the

purpose of propaganda. Other firms have discovered that a more careful selection of persons employed upon machines has significantly reduced accidents. The sense of rhythm is an important factor in enabling an employee to adjust himself to a machine. In the matter of health, medical attention previously described is an important addition to the benefits provided by the State. A third and more valued addition is to be found in the pension schemes which an increasing number of firms are providing as supplementary to the old age pension provided by the State. Equally prized, though much less common, are schemes for assistance to persons who have become chronic invalids and must be retired from the service of the firm before the regular pension age. Though little organized effort is yet noticeable in industry in the direction of insurance against untimely death, many pension schemes contain a provision which makes them into a form of life insurance, whilst a few employers, through what is known as group insurance, do cover the lives of the majority of their employees.

But the chief direction of this demand for security is economic. Workers desire as regular and stable a wage as possible and the greatest possible regularity of employment. British workmen tend to prefer a lower regular wage to one which, over the year, may yield a higher average but which has been irregular. The corollary to this is that an employer can obtain better work from his employees if he can keep the flow of employment steady. This is probably an unattainable ideal in a country like Great Britain. It is, nevertheless, important to do whatever can be done in the direction of—

1. Securing the utmost equity in respect of short time or dismissals consequent upon bad trade.
2. Supplementing the payments under the Unemployment Insurance Act.

An employer who, because of bad trade, cannot keep his workers busy for the full normal week has two alternatives

before him. He may dismiss a proportion of his staff so as to keep just enough workers to do the diminished work in the normal week ; or he may put all employees concerned on to short time, thus reducing the normal week in that proportion. It is now being recognized as an advantage seriously to consider the opinion of the workers on this choice. In most instances, they prefer to share the work among all employees by a measure of short time. Provided the employer determines this measure, taking due account of cost and efficiency of operation, nothing but good can result from the greater contentment inspired by this equality of sacrifice. It may be, however, that the broader interests of the concern would best be met by dismissals. If the firm, or section thereof, is over-staffed, and is not likely to be fully employed for a considerable time ; or if, in the opinion of the management, there are inefficient men on the staff who are reducing the industrial *moral* of the place, dismissals should be made. In such a case, the grounds for dismissal should be made clear to all concerned.

Probably, few firms can attempt to do much in the direction of supplementing the payments under the Unemployment Insurance Act, 1920. Several firms, however, recognizing the reaction of insecurity upon efficiency, are setting aside small sums to be used to supplement the ordinary unemployment benefit.¹

Conclusion.

The betterment of industrial relations is not primarily a matter of method or of regulation. Organization embraces in its subject-matter the work to be done and the people who are to do it. The task of industrial relations is so to fit the people into the organization as to get the work done. Methods and regulations prescribe lines of action. But action itself needs a dynamic, a motivating force. Human impulses yield to the spur and rein. Incentives play a

¹ See e.g. the experience of the Cocoa Works, York, in *The Human Factor in Business*, pp. 102-110.

large part in promoting industrial activity. Sufficiency of wages, good conditions, and consideration for workers are practical business. The spirit of fair play has financial value. A soundly operating organization is dependent upon a high degree of co-operation, and co-operation depends upon the team spirit and motive. Men and women in most industrial countries have a real sense of what is involved in working together. Generations of industrialism have accustomed them, at least in theory, to team work. Out of this type of industrial activity has arisen a general appreciation of fair play. Industrial organization in the past has too frequently denied justice, without destroying the demand for it. The more recent advance in industrial democracy has, on the contrary, increased the demand, and made "a square deal" the synonym for satisfactory industrial relations. Much of what has been described as helpful in promoting better labour conditions may be absent in a factory, provided that the spirit of fair play permeates the management.

At this point, we may fitly leave the discussion. Principle and practice have both been set forth. Labour relations can only be understood after a study of human nature and conduct. Men are actuated by impulses and yield to the power of incentives. Their conduct is governed by ethical principles, and psychological motives. Industrial practice must be so shaped as to take account of these considerations and convert them into allies. It cannot wisely run counter to human nature and human prejudices. But the combination of practical business efficiency with due regard for psychological and ethical considerations is not easy, and failures therein are not venal. The larger part of this section is an attempt to show how by stages a satisfactory relationship may be set up. Some of the proposals may be possible only for a large business, but all of them should form a part of the mental vision of one who would handle labour with mutual satisfaction.

CHAPTER V

MARKETING AND ADVERTISING

By L. URWICK

1. DEFINITIONS

DISTRIBUTION is the third of the great groups of activities which are common to all industrial enterprises. It is not sufficient to create goods or services. A further step is immediately necessary, the disposal of those goods or services to the persons who require them. Such persons are described as "Consumers." Their need for the goods or services is called "Demand"; where they are in a position to satisfy that need by offering value in exchange for such goods or services, their "Demand" is "effective." Where they are definitely related to a producer or distributor by previous or habitual dealing, consumers are called "Customers." If they are not so related, but may be assumed to have an "effective demand" for any product, they are called "Prospects."

Before communication and transport were facilitated by modern inventions, determinate areas and times for intercourse between buyers and sellers were a necessity of all classes of trade. Such gatherings were known as "markets." The word is used to-day in all the meanings implicit in the functions of the original market. One of these was price adjustment; to-day, a client who inquires of his broker as to "the state of the market" is inquiring about price levels. To his broker, however, "the Kaffir market" will imply a group of dealers standing ready to buy or sell South African Mining Shares. From the standpoint of the producer, the word "market" implies any group of consumers combining a demand for his product with the ability to offer the values necessary to make that demand effective. Distribution covers the whole of the activities of any

enterprise concerned with the discovery and development of markets—that is, with the transfer of the product to the consumer.

The functions of the original market were fourfold. The first thing a producer had to know was where he could find a group of persons who would be willing to purchase his goods or services. Having discovered this market, he would transport his product to it. On arrival, he would display his wares to attract the attention of possible customers. Finally, having gained their interest, he would carry out the actual transaction of sale, centring round the question of price. All the complexities of our modern distributive system are merely new combinations and re-arrangements of these four basic processes. They constitute the four main activities carried on under the general heading of distribution.

The first of these is concerned with the discovery and examination of the market. But since most business concerns are already established with a certain definite sale, this activity involves two separate conceptions.

Marketing.

Marketing is “reviewing the established methods of distribution by which goods or services are supplied to the consumer and initiating improvements therein.” It is concerned with—

1. The product itself, and changes which may make it better adapted to the market.
2. The character of the demand.
3. The channels through which the product is brought to the market.

Merchandising.

On the other hand, merchandising is “Establishing a method by which future markets for goods or services may be prescribed.” It is concerned with—

1. Investigating potential markets.

2. Creating new channels of approach to the consumer.
3. Initiating changes in the form or presentation of the proposition.
4. Devising sales and advertising methods calculated to increase returns.

Advertising.

As a result of marketing and merchandising activities, we get advertising, which is: "The communication to possible consumers by display, by sample, or by written or printed symbols, of ideas about the product of any enterprise, designed to create a demand for that product."

Selling.

Only when these preparatory activities have been carried out does the actual operation of selling take place. Selling is: "Obtaining contact with customers and translating their demand into purchases of the products of any enterprise at a price at which the enterprise is prepared to supply them."

Transport.

Finally, we get transport, which is: "The group of activities concerned with the physical transfer of the product of an enterprise to customers who have placed orders."

Portions of this process may have been carried out prior to, or at the same time as, the processes of advertising and selling. But the actual physical transfer to the consumer is almost invariably the final transaction.

Each of these four activities raises definite problems in the control of an industrial enterprise which call for specific methods and machinery for their solution. We shall, therefore, consider in relation to each in turn, first, the administrative questions which come up for decision; and, secondly, the action to be taken by the management as a result of such decisions.

2. MARKETING AND MERCHANDISING

The Administrative Problems.

From the definitions already given of marketing and merchandising activities, it is clear that there are certain cardinal questions which must be answered in arranging for their administration. The first of these is : " What are you going to sell ? "

In most established businesses, this is, of course, already partially settled by the product, in goods or services, which is already on the market. But in any organization which is alert to commercial opportunities, suggestions are constantly put forward for enlarging the existing range of products or for offering entirely new products which seem to hold out hopes of profit. In fact, the question : " What are you going to sell ? " is never completely answered. Any business administrator is forced to keep constantly before his mind the possibility that the demand for the article which he is manufacturing may cease. He must be prepared, if he is to maintain his plant in profitable occupation, to adapt it to such changes.

Apart from changes of fashion, in the purchasing power of the public, and in world activities, technical developments may suddenly destroy the demand for a particular article. A factory builds up a trade in some specific article of motor equipment, such as acetylene headlights. Almost in a season, improved electrical devices supersede acetylene lighting, and its market disappears. The action of competitors calls for incessant watchfulness from this angle ; both in quality and price the manufacturer is perpetually open to attack by competing lines. It is probable that a higher proportion of business failures may be attributed to a sense of false security in a comfortably established market than to any other single cause. On the other hand, uncertainty as to policy, a too-ready ear to fresh suggestions, or a straining after novelty, may dissipate the distributing

energies of a concern. The integration of distributive and productive policies is a vital matter under the stress of modern competition.

Immediately depending on the question : " What are you going to sell ? " is the question : " To whom are you going to sell it ? "

The administrator requires much information before he can make his decision on this point. He has to *relate his product to the consumer* and to assemble particulars as to the habits and economic position of the people who will buy his goods. A special technique for such inquiries, under the title of " Market Research," is a recent development. It is sufficient to note, at this stage, that he must have a constant supply of facts and figures as to the whole body of consumers. He can no longer afford to solve his problems by guess-work or by general knowledge. Specific inquiries for samples from the general public, reinforced by census figures, and subjected to the most rigorous statistical treatment, are essential tools. It is possible for a man who has typewriters to sell to discover in any given area who are the potential users of typewriters, to ascertain which of his competitors are already well-established in that area, and to weigh up the advantage of quality and price which his machine offers as against others. Lacking such a detailed review and detailed figures on these points, he is not likely to arrive at sound conclusions as to his marketing policy.

Having decided to whom he is going to sell his goods, the administrator must next turn his attention to the presentation of them. There are countless different methods of presenting goods to the consumer, and in each trade there is a method of presentation which is particularly suitable to the goods and to the period. But, as in the case of the goods themselves, fashions in this respect are always changing. Twenty years ago, most chemists' shops in this country presented a series of bottles filled with coloured liquid, and of jars filled with salts. Goods were

weighed out into paper bags or bottles as required by each individual customer. To-day, the bulk of the retail trade in chemicals is done in proprietary packages. In trades such as the confectionery and fruit trades, it is frequently urged that the display of the actual goods, since they are foodstuffs, arouses the desire of the consumer, and is the surest method of presentation to effect a sale. It is not impossible that a similar argument lies behind the unpleasant spectacle of the English butcher's shop. Nevertheless, in confectionery, groceries, and fruit, the sale of goods in attractive packages made up at the factory is gaining ground. Obviously, prepared packages, usually filled and sealed by machinery, make for less handling and greater cleanliness. There is a great economy of time spent in retail selling. Countless cases can be quoted of men who have failed to sell perfectly sound and genuine articles to the public, only to be succeeded by others who achieve success with the same article merely by dint of presenting it in a more attractive form.

The question of the presentation and appearance of his product is one which is constantly in front of the industrial administrator. Having decided on his article, its presentation, and the consumer whom he desires to reach, the administrator then turns to the most important question of all from the commercial standpoint, "How much of it is he going to sell?" Upon the decision as to the quantity of goods to be sold depend many issues closely affecting the productive side of the enterprise.

The forecasting of future sales is one of the most difficult and intricate decisions to which the industrial administrator must commit himself. Because of its difficulties, and the liability to error, the responsibility for such decisions is frequently undefined—production being adjusted to the orders received more or less haphazard from week to week, the factory putting up a special effort where orders are unexpectedly large, and contracting its activities if they happen to fall off. This lack of defined responsibility,

supplemented by emergency methods of adjustment, takes the place of the definite decision of an administrator. It possesses the doubtful advantage that it is difficult to blame a single person for a miscalculation. But with the growth of scientific thought on business questions, it is coming to be recognized that, however much it may relieve individuals of responsibility for difficult decisions, it leads to haphazard working and excessive costs of production. Increasingly, a deliberate effort is made to supply to the administrator such figures of past sales, the purchasing power of the community, and special factors affecting different parts of his market, as shall enable him to make a definite forecast of his sales over a period varying from months to years ahead.

The complexity of modern methods of distribution presents a further problem to the administrator. The product may pass through many pairs of hands on its way to the consumer. The manufacturer sells to a broker who deals with the wholesale merchant. The merchant supplies a retailer, and so on. There may be fewer or more links in the chain. The matter is obviously of great importance to the manufacturer. He must acquaint himself with the distributive structure of his particular trade. Any change or possibility of change in the channels by which the product is finally marketed must be foreseen and studied. Usually, he will find an established method of handling this question. Every trade is full of conventions and customs as to methods of charging from manufacturer to broker or wholesaler, and from wholesaler to retailer. But in spite of this, there are nearly always possibilities of varying the channels of distribution, particularly if the manufacturer is dealing on a large scale. The outline of our distributive machinery is being modified at an accelerating speed. Broadly speaking, there is an incessant and desperate struggle for control between the various factors in the chain of supply. The manufacturer who wishes to adopt mass production methods is under an increasing

necessity to secure a certain market for his large output. The economies open to large scale production "only become fully available if and when the plant is fully operated. The market must be of sufficient extent to absorb all that is produced in the establishment. A large, expensive plant, continuously employed, probably produces more cheaply per unit than a small plant, but if it is not given full scope, the cost of production per unit may be far higher than in the latter."¹

On the other hand, the same economies in administration, skilled direction, and purchasing power, which are an advantage to the producer, operate with equal force in the distributive field. In this country, we have the growth of large general department stores, such as Selfridge's, Harrod's, John Barker's, and others. Retail establishments, which up to 1900 were usually managed as small single units, tend to fall more and more under the unified control of large corporations. In the book trade, Messrs. W. H. Smith & Son; in the chemical trade, Messrs. Boots; in the grocery trade, Messrs. Lipton, The International Stores, and others; in the catering trade, Messrs. Lyons, have all established large chains of retail shops.

These corporations are, obviously, very powerful buyers, and in a position to control a considerable percentage of the market for various classes of goods. Faced with this situation, the manufacturer has attempted various counter-measures. Some large companies, feeling that the ordinary channels were insufficient to guarantee their market, have endeavoured by widespread schemes of national advertising to secure a steady demand for their goods from the ultimate consumer. The wholesaler and retailer, however powerful, are thus forced to stock their products. In other cases, manufacturers have actually started retail trading on their own account, establishing chains of shops, usually confined to the supply of goods of their own manufacture.

From the point of view of the individual manufacturer,

¹ J. H. Jones, *Economics of Private Enterprise*, p. 110.

two main questions are involved: "Do present channels through which his product is distributed offer him a reasonable security in the control of his markets?" And, if this is not the case, "Can he obtain such security without too great a risk of incurring the hostility of those upon whom he relies for his existing distribution?" Obviously, a manufacturer who is dependent upon another independent manufacturer, or upon a large wholesale or retail enterprise which absorbs a large proportion of his output, is in a very insecure position. He is always open to the possibility that his customer will seek another source of supply, or, more probably, will undertake manufacture himself with a view to obtaining the profits of both production and distribution. At the same time, any attempt to undertake retail distribution himself, or to ignore one of the links in the existing chain, involves great difficulties. He is entering into competition with those who are already established in a branch of trading to which he is unaccustomed—a venture calling for long and careful preparation and large resources in skill and capital.

The whole question of outlet to the market is one of increasing complexity to the manufacturer, the importance of the distributive process being emphasized by the technical requirements of large machine production. The power of the distributor has been much enlarged. It is no longer possible for the manufacturer to rely on a steady business secured through normal and customary channels. He must be constantly alert to the possibility of improving both his connection with the consumer and the actual outlets for his goods.

Turning to our definition of merchandising, we see that it involves the same problems as marketing, but viewed from the creative angle. The administrator is not so much concerned with the existing channels through which the product is brought to the market, as with the possibility of opening up new markets. These markets may be either vertical or lateral. The manufacturer, by cheapening his

product, may create a demand among strata of the population which have not previously been in a position to afford his goods. Or, by making arrangements for advertising and selling in areas where he has not previously traded, he may tap more population on the same economic level as those who buy his goods already.

Viewing the same problem from another angle, he may think that his present consumers will buy more of the goods he has to offer if they are presented to them with greater intensity both as to display and as to selling effort. This will again involve him in the consideration of devices and channels of approach other than those customary in the trade. For instance, we find greengrocers displaying packets of chocolates, or dealers in motor accessories using their shops for the sale of leather coats, and similar articles of clothing. The tobacconists in this country, faced with the necessity of early closing in accordance with the Shops Act, have placed shilling-in-the-slot machines outside their shops for the sale of cigarettes in prohibited hours. The possibility of such methods must be constantly in the mind of the administrator.

Under the heading of merchandising, he will consider methods of packing his goods in a different form. Some years ago, a very large trade was built up in a mouth-wash, which was based largely on the fact that it was contained in a flask with an attractively-curved neck. The administrator must have constantly before him the possibility that by some slight change in the form of his product, the way it is packed, or the lines along which it is presented to the public, he may achieve a large increase in his available market.

Or, he may devise an entirely new method of selling and displaying his goods. There are many examples of such new methods. In the last few years, the practice of circulating catalogues of goods for distribution by parcel post has gained increasingly in popularity. Producers engaged in the sale of expensive commodities, such as

pianos, furniture, motor-cars, and similar articles, beyond the immediate means of persons with a narrow income, have introduced the instalment method of payment, thus widening their market to an appreciable degree. An increasing variety of goods is offered "on sale or return." The art of advertising is in an active state of evolution, and apart from the more eccentric devices by which traders have sought for publicity, there is constant development in legitimate means of communicating ideas about the product of different enterprises to the public. Competitions, electric signs, sky-writing by aeroplane, the use of the cinematograph, the circulation of books by leading authors,¹ bearing only indirectly on the product supplied, are among recent developments of advertising method. Marketing is colonizing a discovered country: merchandising is pioneering.

The Management Problem.

We must now consider the executive machinery required by the marketing problems and policies of an enterprise. Marketing and merchandising, while constituting a separate and clearly defined distributive activity, have only been so regarded within the last few years, and in a very small number of businesses. In the majority of cases, there is no separate department set aside for this purpose. We must, therefore, regard the question of organization as in an experimental stage. It is possible, however, to indicate the problems which management has to solve in providing the administration with the necessary basis for its decisions on these issues. A consideration of these problems and of the devices adopted to meet them in certain instances will illuminate the nature of the management work required, while leaving open the position of the marketing activity in the general structure of the business.

¹ Professor Oman's book on *Castles*, issued by the Great Western Railway Company.

In the first place, successful marketing and merchandising must be based on definite research. In the United States, the conduct of market research is frequently carried out, not within the business itself, but by the advertising agent. Developments in this direction have now reached the point where advertising agencies with a national reputation will refuse to undertake a campaign in support of any product until they have satisfied themselves both as to the quality and form of presentation of the product and have, by means of detailed market research, satisfied themselves that there is reasonable ground for anticipating successful results. There are strong arguments for entrusting market research to an advertising agency. Such agencies possess a number of clients in various trades. They are more closely in touch with the conditions in various markets, and are able to transfer experience gained in one market to another. They are largely free from the personal influences which are bound to affect those actually employed in a productive organization. They have not been responsible for the creation of the goods under consideration, and can, consequently, review them more impartially and, therefore, more scientifically. As advertisers, they are closely in touch with certain sources of statistical information directly required for marketing purposes, such as the circulation of various newspapers. On the other hand, manufacturers argue that they are in closer touch with their own problems, and the provision of material on which the final administrative decisions of the business are based should be in their own hands.

As far as Great Britain is concerned, it seems probable that the development of the work of market research will be threefold. The exact avenue through which the inquiry is conducted will be determined by the nature and scope of the particular problem under investigation. Certain of the basic information required for a scientific consideration of marketing problems is of such a character that it can be gathered most effectively only by an organization

of the largest size, enjoying the support of the government.¹ Other information is of a character requiring specialized knowledge of a number of trades, and in this sphere the advertising agency will render the most effective service. For instance, there is much comparative information as to the public response to various types of package which can be transferred from one trade to another. But there will remain a residue of questions so highly technical or so intimate in their character that they demand the special interest of the individual business concerned, and will be investigated most fruitfully by men trained in and employed by that business.

Wherever the work is done, the manager who is responsible has the definite duty of arranging for market research and for the presentation of the information on which the administrator may base his decisions as to marketing and merchandising policy. This information may be classified in various ways. Usually, it falls into two broad classes, that which is specific to the particular inquiry and that which is wanted for any inquiry on which the men responsible for marketing may be engaged. The first class must deal with such problems as arise when marketing policy has already been translated into definite selling and advertising effort—the situation in all established businesses. It is concerned with questions such as—

1. The existing demand—is new demand being created by the selling and advertising methods at present operated ?
2. The product—are orders being received a second time from those customers who have already purchased ?
3. The effects of competition and of competitive advertising.
4. The attitude of distributors towards the concern, both as regards its goods and its policy—are they friendly and co-operative ? If not, what are the reasons ?

¹“ The recent report of the Balfour Committee was essentially a piece of broad market research.”—Sinclair Wood in *Business Research*, May, 1926.

General information is more complicated and of wider scope. First, it is concerned with the general character of the population. It includes such matters as the social classes into which they are divided, their location and their buying, reading, and general habits of life.

A second group of data is concerned with the analysis of the markets under such headings as the number, location, and attitude of the retailers and wholesalers in various trades in each district, and the marketing channels and procedure and the physical features of each area. A third group deals with facts definitely bearing on the problem of distribution, such as districts which are likely to show a ready response to marketing effort, the details of selling plans in various trades, and notes on the influence of retailers on the body of consumers.

The methods available for obtaining such information are, of course, varied. Broadly speaking, the sources are either bibliographical or personal. Bibliographical sources include libraries, books, periodicals, official or semi-official publications, and statistics. Under the personal head come the staff of the organization concerned, competitors, dealers and retailers in the trade, trade journalists, specialists of various kinds, and the whole body of consumers. Personal information may be collected in conversation, by letter, or by questionnaire. One writer, after four years' experience of research in British markets, says: "I have found the questionnaire sent through the post to be the most expensive method of all. However large the number of informants that have to be seen, provided that the area is not too scattered, the extraction of information by face-to-face conversation is the best method."¹

The person responsible for gathering this information in an established business will naturally inquire how far he can make use of the information supplied by the existing sales force as the basis of his researches among actual

¹ Sinclair Wood, "Market Research from the Advertising Point of View," *Business Research*, May, 1926.

consumers. On this point, there is no general agreement. On the one hand, there are very strong arguments of economy and custom in favour of using the information gathered by the salesmen as the basis of market inquiries. A body of salesmen who do not feel that their views as to the conditions in the market are an important factor in determining the policies of the enterprise, are apt to lose constructive interest. On the other hand, the very nature of the salesman's task and daily experience is apt to render him unsuitable for work which essentially requires a detached and unprejudiced attitude. He has his own work of selling to do, and is likely to be embarrassed and irritated by frequent requests to compile standardized market data. His reports are more likely to reveal his immediate prejudices than a real attempt to survey his situation objectively.

Second only in importance to the task of arranging for research is the manager's problem involved in sales planning and sales forecasting. In order to supply the figures necessary for the final estimate, he has to arrange for the collation of much of the information already provided for by his research organization, but regarded from a somewhat different angle. He has to determine in advance, not only what the total sales of the enterprise are likely to be, but what individual sales may be anticipated for each article on its price list. He has to show where and how these sales can be secured.

Broadly speaking, the categories of facts available to him on which he may base his estimate are five—

1. Those relating to the general level of purchasing power of the whole body of consumers.
2. Those relating to local conditions modifying the conclusions which would be drawn from a general estimate of purchasing power.
3. Those representing specific past experience, such as the actual figures of sales in the line under consideration or in similar lines.

4. Estimates of the selling possibilities of each particular line drawn from the experience of salesmen or from the material provided by special investigations.

5. Knowledge of the advertising and other assistance which will be available in support of the sales of any particular line.

The general purchasing power of the community is the resultant of many economic forces which require specialized consideration for their correct interpretation. The cyclical rise and fall of general business conditions which was regarded at the end of the last century as an inevitable visitation of nature, is now conceived to be due to a complexity of definite causes which may ultimately be brought under general control. The signs of such movements in bank clearances, credit rates, value of stocks, tonnage carried, wage rates, wholesale prices, cost of living figures, and similar indices, are increasingly the subject of economic study. The task of applying such general economic knowledge to the problems of a specific business is now sometimes allocated to a trained statistician or economic adviser. Certain universities prepare charts and diagrams showing the general statistical position. The marketing manager should provide from whatever source both a general estimate of purchasing power on any national market, and calculations as to the local causes which will involve fluctuation about the mean of the national average.

The chief factor to be considered by the manager in preparing estimates of forward sales is the detailed figures of past sales of the same or similar lines. A word of caution is, however, necessary. In any market where fashion exercises a considerable influence, or there is a wide choice of alternatives before the consumer, the possibilities of sudden and inexplicable fluctuations are very great. It is his duty to ensure, by maintaining the necessary contact with the officer responsible for statistical work, that these figures are presented in the most illuminating form. He takes into account the possibilities and probabilities. For

instance, the figures may reveal that the sale of a particular line per thousand of the population is three times greater in one portion of the market than in another. This is an immediate challenge to special inquiry and a suggestion that past figures do not represent the full possibilities of sales. He should, therefore, reinforce his statistics by a careful analysis of the information supplied by men who are actually in contact with his customers, and of the material obtained by his research organization. Finally, the amount of the resources available for advertising, the character of the advertising, and whether advertising of special products is in view, will all influence the sale of particular lines.

In certain trades, such as the sale of machinery for special purposes, it is possible, by detailed analysis, to arrive at an appreciably accurate estimate of the total number of possible buyers in any given area. Starting with a presumptive sale to each prospect, it is possible to construct a complete plan of sales based on the individual transaction. In other trades, where the manufacturer is several degrees removed from the consumer by wholesale and retail channels of distribution, or where the article sold is one of general consumption distributed in detail to large numbers of customers, this method of estimating is clearly impossible. The sales plan, to be of practical utility, must generally start with the total estimated sale based on past experience, corrected by the economic position, and work down to the details of individual lines from that initial calculation. The marketing manager should determine exactly which type of calculation is best suited to the conditions, and make his arrangements accordingly.

A second problem arises from the relations between the manager responsible for the sales forecast, if he is an independent person, and the manager responsible for sales. While the manager responsible for the sales forecast can prepare, in broad outline, the estimate of the sales which should be achieved in each predetermined area of the

market, there are factors arising from the character of the sales force which may profoundly modify the statistical situation in this respect. It seems doubtful if, in any case, where a large sales force is employed, the marketing manager can be expected to allocate his quota of sales to the individual salesman. The general principle which has been adopted in some businesses for dealing with this problem is to limit the duty of the marketing organization to determining the total sales of the business and of each line on the price list. Beyond that point, the planning of sales is taken over by the sales manager, who, with the assistance of information supplied from other sources, allocates the total estimate to his different sales areas and, sometimes, to individual travellers.

With the greatest care and skill in the preparation of the figures and of the estimates based upon them, it is unlikely, in a business with a large price list, that the marketing manager will invariably forecast the sales of individual lines correctly. He has frequently to make his estimates a year or more in advance if he is to give production and the selling force the guidance which they require. The public is fickle and competitors are active. The marketing machinery must provide not only for the initial estimate, but for rapid adjustment of the sales plan in detail and for the communication of such changes. Moreover, where the production of particular lines involves the purchase of considerable supplies of ancillary material, such as containers, sudden changes in the level of sales may involve serious loss in accumulated stocks. It is the duty of the marketing manager to watch the progress of sales in comparison with his estimate almost daily, and to take the earliest opportunity of warning those responsible for the purchase of materials should he think it probable that he will have to alter important estimates to any appreciable degree.

In this connection, the placing of new lines upon the market throws a special responsibility upon those who lay

the foundations of the estimate. Where a line is already on sale, there is a considerable mass of past experience which is, at all events, some guide in framing calculations as to the probable sale. But where an entirely new product is involved, the problem is a very different one, and the possibility of error is very much increased. In these circumstances, it is becoming usual to sample the market by selling the line over one or more selected areas sufficiently in advance of its introduction to the market as a whole, to enable an estimate to be made on the records of this practical experience before orders for machinery, materials, and so on, are placed. Such experiments are essentially market research, and while they will usually be managed by those in charge of selling, the marketing manager will consider with special interest their results, the opinions expressed by salesmen, and similar material. As a further guide, it is frequently possible to obtain sales figures relating to similar lines. These figures, if presented graphically, can be made to form the basis of a comparison with the initial sales of an experimental kind also expressed in graphic form. It is then frequently clear from the mere trend of the line expressing the sale of the new article, that it is likely to follow a similar course to that of the line with which it is being compared. While there are risks about comparisons of this description, they probably offer the best prospect of an accurate and scientific forecast of the sales of an entirely new product.

In general, in dealing with forward estimates of sales, the manager responsible for marketing will be wise to make the fullest possible use of the graphical presentation of figures, since it is often only when complicated data are satisfactorily charted that immediate tendencies reveal themselves.

The third main duty in the management of marketing activities is the translation into executive action of decisions as to what goods are to be sold, and the form in which they are to be presented. The manager will have to present

to the administrator the designs and suggestions on which such decisions are based. Here, again, there is large variety in industrial organization. In many industries, new design is left to the casual suggestion of salesmen or the bright thoughts of those who happen to be engaged on production. But continuous and constructive thought on the problem of new products, the translation of ideas into experimental samples, the testing and costing of such samples, and their adaptation to the conditions of mass production, the artistic work and experiment necessary to the achievement of dignified and economical design, are specialized activities which must, in due course, be separated from the absorbing administrative work of the factory departments, and cannot be achieved as the by-product of a salesman's evening hours.

It is clear that this question of design closely affects both production and distribution. The product itself is the most intimate interest of the production manager. He is responsible for effectiveness and economy in methods of manufacture. On the other hand, where display of the article itself, or of the container, is an important influence in securing sales, the character of such display is an important factor in advertising. In any business where a supply of novel products is an integral factor in commercial vitality, the task of securing suggestions and ideas, of selecting between alternatives, and of making the detailed preparations for launching new products upon the market is a continuous one. In the majority of enterprises, the traditional rights and authority of the production and advertising departments necessitate a cautious development. It is clear, however, that the very overlap of production and advertising considerations involves the necessity for co-ordination. This is probably more effectively secured by the appointment of a third party with powers of decision and constructive responsibilities for maintaining the supply of new products, than by any system of committees or conferences. His intimate contact

with the market, and constant research into consumer demand, suggest that this duty is properly allocated to the marketing manager.

The question of the price at which a product shall be placed upon the market must form an integral part of the whole discussion as to marketing policy. Broadly speaking, three main lines of approach have characterized the handling of this question. Many undertakings have determined their prices on the principle of charging all that the existing market would bear. A second and more usual method has been that of charging a standard gross profit on the actual cost of production of the article, or on the selling price. Both these methods have been incessantly modified in practice by the influence of competition. And thus, in some cases, manufacturers have fixed their prices almost solely in relation to the prices charged by their competitors. The question of pricing has, however, been profoundly modified by technical advances. Manufacturers are beginning to appreciate more clearly the full possibilities of economy latent in mass production by machinery, provided that a sufficiently wide market can be secured. At the same time, the influence of price reductions in enlarging the market for a commodity has received closer attention.

Since most enterprises manufacture not one single article, but a range of allied or similar products, the relation between production cost and the quantity produced must be viewed from this angle. Many of the economies possible with mass production are lost if the range of articles manufactured is a wide one. Machines have to be changed over from one process to another. Administrative expenses are multiplied by the purchase of a large number of different ingredients, difficulty in tracing various stocks, uncertainty as to the division of costs between the various products, and so on.

Assuming that marketing is a separate function under an independent manager, he will require only a small staff. Someone has to arrange for the collection of the facts and

figures involved in market research ; if elaborate inquiries are undertaken, outside staff, for the definite work of investigation, will be required. The task of designing and selecting new products involves the employment of a few artists or technical men under the close control of a single person responsible for novelties. The estimation of forward sales is a question of making use of the figures provided by the statistical records of the organization, not of preparing elaborate material specially. In short, the marketing man supplies the link necessary to guide and co-ordinate the executive activities of others. He does not manage a large number of persons himself. He constitutes the transmission system of the industrial machine. This does not, however, detract in the least from the immense importance of his function to the health of the enterprise and the weight of the responsibility which rests upon his shoulders.

3. ADVERTISING

The Administrative Problems.

The administrative problems which arise in connection with advertising inevitably depend, to a large degree, on general marketing policy. The growth in advertising methods and technique which has taken place in the last quarter of a century is one of the most striking features of our business evolution. The power wielded through successful advertisement is undoubtedly enormous, though open to grave abuses. But against the great expense of competitive advertising there is a very big credit account. The attempt to improve the form of modern advertising, both in typography, illustration, and design, has undoubtedly been a factor in improving public taste, spreading a demand for improvement in the form of the goods themselves. The "Truth in Advertising" movement, which has made great headway in the United States, is evidence that those engaged in advertising as a profession appreciate the necessity of high ethical standards, and we may look

for a growing professional distaste for the advertising of goods which are other than they are represented to be.

The first question which the administrator must ask himself in approaching the general problem of advertising, is whether he is going to advertise or not. Advertising of some kind there must be. It is integral to the very process of distribution. It is not possible to conceive of any person entering into a transaction for the purchase of goods unless, in some way or another, his attention has been called to those goods. For instance, the manufacturer's traveller may have shown him samples, or the manufacturer may have sent him a catalogue or circular. Both these activities are forms of advertising; they are concerned not with the actual sale of the goods, but with their *display with a view to sale*. But, while it is doubtful if it is sound business policy, it must be remembered that it is still possible to conduct a prosperous business with very little display of the goods other than that conducted by competent salesmen, the wide distribution and reputation of the particular manufacturer's products being maintained by their high quality and the goodwill of the retailers. In most trades, however, under modern conditions, this is a procedure which will lead straight to disaster. The exigencies of competitive trading demand a wider margin of security than is represented either by the public's memory for high quality, or the trader's goodwill. Expenditure on advertising there must be, and sometimes very heavy expenditure. The task before the administrator in determining the policy which should guide such expenditure is fourfold.

The first question he must ask himself is to whom will his advertising be directed?

In a trade where the distributive machinery is complicated, the wholesaler or the retailer is the immediate customer of the producer. By providing retailers with material for dressing their windows, in the form of show-cards and posters, by equipping wholesalers with catalogues, illustrations, and other matter descriptive of his products,

he may assist these partners to the distributive process in attracting the attention of the consumer. A large annual expenditure is devoted by manufacturers to Press announcements in the trade papers which circulate largely among the wholesalers and retailers in their particular trade. The limitations of the policy of advertising through the wholesaler and retailer have already been indicated. But on the other hand, a larger and more immediate effect can sometimes be obtained in this way, with a smaller expenditure than would be involved in a direct appeal to the consumer. Undoubtedly, the salesman behind the counter has a very large influence in determining the direction of public demand, particularly when there are a large number of alternatives open to the consumer. It is doubtful whether it is possible to create a reliable and persistent demand for a specific brand of jam, pills, boots, or motor-cars without enlisting and maintaining the goodwill of the intermediate partners in the chain of distribution. But the administrator is bound, at some stage of his development, to consider the direct appeal to the consumer by means of the Press, posters, and similar channels.

The condition of the public mind, which leads the great body of consumers to ask for a particular brand of an article in general use, and to insist on obtaining that brand, is described by Americans as "brand consciousness." In England, we often say that the name of a particular manufacturer has become a "household word." But, perhaps fortunately for humanity, household words are very easily forgotten. And the instability of public demand, unless maintained and reinforced by persistent advertising, is one of the most interesting features of our modern economic system.

The attempt to forecast and to control this unstable demand is one of the primary tasks of the business administrator. One of his chief resources in obtaining such control is the power wielded by modern methods of advertising. Nevertheless, however great his expenditure on Press

advertising, he will certainly find himself in difficulties if he does not pay constant attention to the strong influences wielded by those in direct contact with the purchasing public. That influence is personal—the suggestion conveyed from individual to individual when they are face to face. Certainly, at our present stage of development, and, so far as we can tell, permanently, that influence in its more restricted sphere is always likely to remain a stronger force than the influence exercised by printed symbols.

The second question he must ask himself is: "What is the general object with which I am advertising?" Of course, he is advertising in order to increase his sales and to secure a permanent market. But there are two angles of approach to this general object. A manufacturer may seek either to advertise his goods directly or to advertise his business. The two things are not quite the same. In the first instance, the administrator will think primarily of his current sales; he will relate his advertising to specific articles in his price list to which he wishes to call the attention of the public. He will be inclined to judge the failure or success of his advertising schemes by their effect on the demand for particular products. And if changes of fashion or other causes force him to remove those products from his price list and to substitute others, some part of the effect of his advertising will inevitably be lost. Realizing this, he may determine on the somewhat slower process of advertising the name of his business, with a view, in the long run, to making the public associate that name inevitably with the class of article which he is producing. This form of advertising—commonly known as institutional advertising—can have very far-reaching effects if pursued persistently and carefully over long periods. One leading company in the United States, in the front rank for its particular product, has never mentioned the goods it has for sale over a long period of years marked by colossal advertising expenditure.

The pros and cons of this broad question can hardly be

stated theoretically. They differ for every trade and for different stages in the development of a business. Certain classes of goods lend themselves to direct advertisement ; in the majority of instances, services do not. But even to this rule there are many exceptions. A railway company will often draw the attention of the public to the attractions of a particular watering-place which it serves, or to a special excursion, though the trend of its advertising is to emphasize the general amenities of travel to be enjoyed upon its lines. The problem must be settled empirically in relation to the circumstances of the particular business. But in the case of all great businesses which are strongly influenced by changes in fashion and taste, there comes a stage when the waste involved in the advertising of particular products which can only enjoy a temporary popularity has to be reviewed. The possibility of concentrating advertising expenditure on the institution rather than on any particular lines which it manufactures must be seriously considered.

A review of the actual behaviour of business organizations in this matter reveals that, at the present juncture, no definite principle has been worked out. In women's clothing, the practice of advertising certain branded goods, particularly silk stockings, is largely on the increase ; formerly, the particular retailer or department store tended to emphasize the name of the institution. In many trades there is a tendency towards group advertising which emphasizes the uses of the general class of product which the trade produces, rather than the name or the brand of any particular advertiser. The public in England is well-acquainted with the slogan "Eat more fruit." Cement manufacturers publish an extensive journal emphasizing the use of cement in all types of construction. Insurance companies, again, follow both practices, some of their advertising emphasizing the stability of the particular organization, while other publicity is concerned with the merits of particular policies. The chief considerations

which are before the administrator on this matter are on the one hand the necessity for current sales, and on the other the fact that expenditure on institutional advertising usually builds a permanent asset.

The third question which the administrator must ask himself is how much he is prepared to spend in order to press the sale of his goods? The amount he must spend when he is appealing to the general public is much larger than that required if he limits his effort to wholesaler or retailer. His policy, if he is seeking to build a permanent goodwill, will be determined by different considerations than those which will weigh with him if he is concerned almost entirely with current sales. In the first case, his line of action may be determined without immediate reference to his trading account for the current year. A vendor of patent medicines, for instance, in placing a new product upon the market, will estimate that a certain initial expenditure is necessary in order to popularize the line and to make the public acquainted with it. This expenditure he will regard in the same light as the money he must lay down for the formation of a public company, and he will not allow his initial advertising to appear in his trading account entirely against the profits of the first year's business.

If, on the other hand, the manufacturer is chiefly considering current sales, the sum which he "appropriates" to advertising will be strictly determined by the amount of the estimated sales which the advertising is calculated to produce. Thus, a manufacturer producing a large range of products will tend to push those products with a high margin of profit by means of advertising, since the margin enables him to expend a considerable sum on publicity and still leaves a reasonable percentage of profit on his turnover. In most old-established businesses, the advertising expenditure must be considered from this angle, that is to say, the amount expended in any year is determined by the margin of profit which it will render available.

In practice, there are usually previous years' experience on which to base the policy. The manufacturer makes a calculation that additional advertising will yield such and such an addition to his total sales, representing such and such an estimated gross profit. Deducting the cost of advertising as a whole from his estimated gross profit as a whole, he decides whether the additional advertising cost will yield him a larger margin of profit than he obtained in the preceding year.

Having determined with what general object he is going to advertise, to whom he is going to advertise, and what is the total amount of money he is prepared to spend, the administrator has one more main problem to settle. He has to distinguish between the various channels by which advertising can be carried out, and to decide which of those channels he will use.

The manufacturer who wishes to exhibit his goods through retailers may take one of several courses. In the first place, he may decide that, primarily for this purpose, he will own a certain number of retail shops in his own line of trade. The same object may be achieved by the purchase of an interest in retail companies, such an investment being dictated primarily by the desire to obtain a favourable exhibit of his goods in the windows of their shops, rather than by any idea of obtaining complete control of the necessary retail outlets to keep his factory busy. Where this is the case, the risk taken in obtaining financial control of such shops or companies is essentially an advertising risk. More usually, the manufacturer will offer inducements to the retailer to display his particular product. The most obvious inducement is, of course, cash. This frequently takes the form of a discount on goods purchased. Alternatively, he will provide the retailer with special services assisting towards the display of his goods. For instance, on the receipt of an order of a certain size, he will issue material to assist him in dressing his window. Such material ranges from the very humblest showcards,

costing a few pence each, to elaborate structures designed to fill the whole window, electric light for special effects, counter cases, and similar shop fittings. A gift to the retailer of dummies of the manufacturer's goods, which can be freely displayed in the window without deterioration of the stock, is another favourite device. The more advanced manufacturers maintain a specially-trained staff who undertake the actual dressing of his windows for the retailer. They are taught how to arrange goods attractively so that they catch the attention of the passer-by. They do not necessarily limit themselves to their own company's goods. They are taught that the character of the service which they render to the retailer must be such as to dispose of the whole of his stock and not only of a portion. But the opportunity offered by their entrée into the shop results in additional emphasis on the specific manufacturer's products. In the United States, this "dealer's service," as it is called, has been carried to a great length, manufacturers not only providing advice and assistance in the dressing of the windows, but sending skilled accountants and commercial engineers, who will advise retailers as to their system of business, the training of the salesmen and the like. The Co-operative Wholesale Society has done effective work along similar lines in this country.

Turning from display to samples, these may be distributed either to the retailer or wholesaler, or direct to the consumer. In the first instance, samples will usually be carried by salesmen of the manufacturer concerned, and there is room for much ingenuity and discretion as to the range of such samples, and the form of their presentation and packing. Sampling direct to the general public is a form of advertising which is in an experimental stage. In certain instances, retailers have been asked to undertake the distribution of such samples, but on the whole this has not proved satisfactory, even when the samples were supplied gratis to the retailer. The principle of distribution, house to house, by a special staff employed

by the manufacturer, has certain advantages in attracting attention, but is extremely costly. The most usual course employed up to the present has been direct distribution to the public by post. This has taken two forms. In the one case, a manufacturer has enclosed a small sample of the new line in each package of another product, already widely distributed. This method ensures that the sample reaches the consumer. But considerations of cost limit its size. There is considerable uncertainty as to its effect. Samples reach many members of the public who are not really interested. In other cases, invitations to write for a free sample are issued in the Press. This enables a larger sample to be offered. It secures that a free supply of the product is sent only to those members of the public sufficiently interested to send a post card.

Sampling, which is an extremely expensive form of advertising, should only be attempted after the most rigorous research and experimental work over specific areas or groups. The experience available suggests that it is of the greatest value in the cases of those products where consumption is a habit, that is to say, the products purchased definitely on personal taste. Such habits of consumption, based on taste, once established are comparatively proof against ordinary competitive effort for the time being ; they, therefore, repay heavy initial outlay in sampling. A particular brand of shaving cream or tobacco, once adopted by a consumer, is apt to be retained. On the other hand, this habit effect is weakened where other instincts, such as the parental instinct, are concerned. The very wide sampling in such articles as baby food, which is characteristic of modern advertising, is of doubtful utility to producers. Here, the consumer is not consulting his own taste, but is guided by the day-to-day health of his infant, and is very ready to try a change should the child show signs of sickness.

The main expenditure in modern advertising is directed towards the method of attracting attention, by written or

printed symbols. The means of conveying such symbols to the consumers are many. The most important is undoubtedly the public Press in its various forms. A very large amount of modern selling is conducted by means of appeals to social groups of consumers through the post. The catalogue which the manufacturer prepares for the use of his salesmen and customers, whether wholesalers or retailers, is the simplest form of advertising expenditure of this kind. It is the modern equivalent of the notice for sale on a particular date and at a particular place originally announced by the town crier. The method survives to-day in the bills displayed by land and house agents. Such printed bills or posters are directed to those members of the public who are likely to be particularly interested in that specific sale. Corresponding to this we have the appeal to the general body of consumers following the same method. Manufacturers of articles in general demand rely very largely upon attractive displays on the hoardings, often coloured, and devoting a considerable portion of their space to pictorial appeal.

The administrator, in allocating the proportion of his advertising to be given to written and printed symbols, must decide between the varying claims of catalogues, price-lists, leaflets, Press appeals, and posters, directed to the general body of consumers, and special letters or pamphlets, addressed to customers and consumers who are presumed to be particularly interested in the article concerned. Appeals to the general body of consumers absorb a larger proportion of advertising cost. The variety and distribution of the daily, weekly, monthly, and specialized Press, offer great opportunities to the manufacturer who desires to interest the general public in his wares. The art of poster design improves year by year, and constitutes a definite factor in the education of the consuming public. The administrator has to decide, in the first instance, between Press appeals and hoardings as a medium for his written and pictorial appeal. Should

he decide upon the Press, he has to distinguish between the various media open to him. A certain amount of space in a daily paper with a large circulation costs a great deal more than an equivalent space in a technical or trade journal published weekly with a small circulation to specialized purchasers. His decision between these channels of distribution will probably depend on the answer to the previous question as to whether he is advertising to the trade or to the general body of consumers. Generally speaking, he will attempt to get some idea of the circulation of the various journals which he is considering as a medium for his publicity. He will consider carefully the type of reader which the particular journal commands, and the position of the space in the make-up of the journal. Probably he will work out a standard cost per inch per person of advertising in the various forms of journal, and will then balance out the advantage of appealing to a wider generalized public at a smaller average cost, as against the advantage of appealing to a smaller specialized public at a higher average cost.

Two special forms of advertising carried out through the Press must be mentioned. The first is competitions. The competition in selecting posters recently conducted by Bovril, Ltd., is a case in point. The second is the offer of prizes in exchange for coupons representing the purchase of a given quantity of goods. This latter method undoubtedly exercises a very direct influence on sales, but it is doubtful if it can properly be regarded as an advertising cost. The expense of the prizes and of organizing their distribution is really a discount on the retail price of the article. In this country, the law as to lotteries distinctly limits the ingenious advertiser who seeks to devise new forms of competition. But both competitions and the premium system are very widespread, particularly in the sale of articles of general consumption. The premium appeals to the desire common to most people to get something for nothing. Of course, the something is carried

in the price of the goods, but in form the prize appears a free gift and attracts a popularity which it does not really merit. The various competitions make a double appeal both to the emulative impulse and to the love of a chance.

It will be seen that the administrator who has to settle the advertising policy of a business, requires the fullest support from the facts collected by those responsible for market research. The financial question is the root of all advertising policy. The administrator is never at a loss for directions in which it is possible to spend money on advertising. His problem is to ensure that that expenditure pays a dividend. There is no drain in business down which it is easier to pour resources than the advertising appropriation. Opportunities for advertising this or that product present themselves continuously. There is constant pressure for larger sales. He has to balance out all these claims and to make the final decision both as to the maximum sum which the business can afford and as to the methods of spending it which will prove most fruitful. It is essential that these points should be decided in advance and that all proposals for expenditure should be subject to them. It is then possible to present the problem of advertising policy in its true form as a careful weighing of alternatives.

The Management Problem.

The advertising policy settled, it remains for the management to provide the necessary machinery to put it into execution.

Under the heading of display falls the work of preparing the necessary material for use by the retailer. This may take the form of cards, bills, or other announcements, the preparations of special dummies of the goods, and the design and trial of various forms of window display. If a staff of window dressers or advertising inspectors is maintained, these men will have to be trained and equipped. When engaged in their work, they must be supervised,

their arrangements planned, and their expenses checked. Containers must be studied and improved from the advertising standpoint. Copy required for the Press, the designing of posters, and the preparation of editorial matter have to be arranged. The cost of all advertising placed with the Press, of billposting, and of similar forms of expenditure, must be carefully recorded, and responsibility assumed for retaining the actual expenditure within the total determined by the policy of the administration. Finally, records will be needed which afford some basis of comparison between the cost of various forms of advertising and the results. Such facts are extremely difficult to reduce to measurement. It is frequently impossible to assess the value, for instance, of window displays, except by means of the reports of special inspectors who ascertain, from the retailers concerned, the amount of increased business they have enjoyed as the result of the display.

How far this particular work is carried out within the organization of the manufacturing enterprise is a matter for administrative decision. Where full use is made of the whole of the services offered by an up-to-date advertising agent, the actual managerial work within the producing enterprise will be small in quantity. It will resolve itself into the maintenance of records, liaison with and check upon the work of the advertising agent, and the necessary co-operation with the marketing and sales management.

In most instances, however, businesses have found it desirable to supplement the work of the advertising agent in one direction or another. Both on the marketing and merchandising side, and in relation to the work which more directly belongs to advertising, the position of the advertising agent in this country has not been fully worked out. The profession attracts men of an energetic and original type of mind, who are inclined to be ahead of the manufacturers in the consideration of advertising and marketing problems. The marketing side of the average British

business has been neglected in the more immediate past. In consequence, at the present moment, the advertising agents are in a very strong position. There is, however, no historical precedent for the present ineptitude of the British manufacturer in dealing with market problems. Speaking of the period of our history between 1660 and 1760, a recent writer has said: "In this brilliant era of commercial development, business was for the first time departmentalized broadly along the lines we know to-day. Most of the modern methods of marketing, both here and in the United States, owe their origin to these pioneer traders of the seventeenth century. At that date, marketing problems appear to have been as pressing as those of production. The foundations of commercial supremacy were apparently laid then, because Englishmen knew how to sell better than their neighbours, rather than because of any extraordinary merit in English products."¹

It seems probable that as the importance of marketing problems becomes, once more, keenly appreciated and studied by the English manufacturer, the tendency to place a large proportion of the executive work in the hands of the advertising agent will be reversed. Manufacturers will establish their own staff of artists, window-dressers, and similar craftsmen for the executive side of their advertising work. They will leave to the advertising agent his original function of placing copy with the Press.

¹ Cecil Chisholm, "Marketing and Merchandising," *Modern Business Texts*, Vol. III, p. 13.

CHAPTER VI

SELLING AND TRANSPORT

BY L. URWICK

1. SELLING

The Administrative Problems.

IN dealing with marketing and advertising, we have been concerned with functions which, in any industrial enterprise, are primarily administrative in character. The nature of their problems is such that decisions as to policy are the largest and most essential part of their successful conduct. Once such decisions have been taken, the task of management, while highly skilled and of very great importance, is nevertheless comparatively simple. Selling, on the other hand is, above all, an executive activity. While decisions as to policy are of great importance, they will produce meagre results unless supported by controlled and effective action on the part of the managers and the rank and file of the sales force. When marketing and advertising have alike done their best, there comes the critical moment when the company is actually in contact with its customers, and a sale of its goods is secured or is lost in each particular instance.

For these reasons, the main administrative problem which faces the man responsible for selling is a problem of personnel. How is he to obtain and to retain the right type of man to represent the company in these critical transactions? Under the heading "obtain," he will have to consider (1) the company's policy with regard to the recruiting of its salesmen and other staff connected with the selling process; (2) arrangements for training. The word "retain" has an even wider content. It includes (1) decisions as to the type of organization under which the salesmen will work; (2) arrangements for remunerating

them, and for applying other stimuli to sales effort ; (3) methods of assessing results ; (4) the principles along which disputes as to areas may be rapidly adjusted ; (5) arrangements for superannuation ; (6) supplying salesmen with the necessary information and support ; (7) ensuring that the enthusiasm with which each of them starts his task is maintained and fostered through difficult periods.

In approaching this broad question of personnel, the administrator will, of course, be guided by the decisions given under the head of marketing as to the channels of approach to the customer. He will already have decided whether he is going to deal with the wholesaler or with the retailer, or with both. He may have determined to exclude the wholesaler and the great majority of retailers altogether, and to arrange for his distribution through a number of exclusive agents, one in each large area of population. He may have abandoned the normal channels of distribution and limited himself to sales in retail stores owned by the company. Finally, he may have decided that his selling will be done entirely by post.

The character of his salesmen's work will necessarily be very much modified by such decisions. If his marketing policy contemplates approach to a small circle of wholesalers only, he will usually be dealing with fairly high-grade business men. His customers will be trained buyers, thoroughly used to weighing-up markets, making a close assessment of the value of any proposition offered to them, and accustomed to dealing briefly and pertinently with highly-skilled salesmen. While of great importance, personal considerations will tell less with such men than the value of the proposition and the force with which it is presented. In dealing with a large number of retailers, however, and still more with the general public, the personal relations established between the salesman and the buyer become of primary importance. If he is representing a large business, the salesman will probably have a wider knowledge of the trade than the individual retailer.

Generally speaking, too, the administrator will find that the existing or potential channels of sale, indicated by his marketing policy, include more than one type of customer. The problem of selling to the large department store is obviously different to that of selling to the small one-man concern in a by-street. Particular groups, such as the co-operative societies, theatres and places of amusement, educational institutions, or banks, may have a specific interest in one or more of his products. Specialization, in such cases, will obviously have advantages. Given a salesman of a suitable type confined to any one of such groups, he will, in time, build up a most valuable acquaintance with their principal buyers, with the internal problems of that type of organization, with the best methods of approach, and with the character of their trade as a whole. On the other hand, travelling expenses vary directly with the number of customers in each geographical area. A salesman who is only seeing one or two customers in each town will have practically the same expenses as a salesman who is visiting half a dozen or a dozen. This consideration makes against the appointment of specialist travellers for particular groups, and in favour of the organization of the company's selling by areas, each salesman calling on all the customers of the company within his particular area. The question of whether specialists are to be employed or not, and in what degree, is a cardinal issue in selling policy which must be decided by the administrator.

A further decision which he must make prior to settling the character of the salesman's work, is the form of his selling control and organization. The study of scientific methods of organizing and controlling a sales force is of comparatively recent growth in this country. In the past, it was usually the practice for all the salesmen to report direct to the headquarters of the company, and for control to be exercised, on more or less haphazard lines, by one of the directors, who might or might not carry the title of sales manager. Each man was left very much to his own

devices to get the best sales he could achieve in his own area. As a result, the salesman usually came to the conclusion that any good results he might secure were to be attributed to his own peculiar and personal genius for the task of selling. This attitude was tacitly accepted. Salesmen with good records were paid large salaries and high commissions because it was believed that they possessed a peculiar quality not found in their fellows.

To-day, while there is a large amount of research still to be done on this subject, there is a general tendency to take the mysticism out of the selling process, and to regard it more scientifically. The first change which took place was a change in organization. As the size of the business expanded, it was realized that a group of completely independent salesmen, following their own methods in their particular areas, was not a suitable medium for expressing the policy and the personality of a great enterprise which wished to pursue a consistent attitude towards its customers. The process of growth in itself raised great difficulties in administration, due to the fact that each salesman regarded the area which he had cultivated as his own particular property. Where the growth of population and the increase in the company's business suggested that it would be more profitable to employ two salesmen, it was frequently difficult to establish a second man's position. The inclination of the established man was to retain the best customers in his own hands, thus introducing a form of specialization which, while extremely favourable to his own results, was very discouraging to the newer man. For these reasons, greater efforts were made to control the processes of selling. Usually, a sales manager was appointed, operating from headquarters, and concerned with the general oversight of the sales force. Where suitable men were selected, this oversight was found to increase and improve sales. In many businesses it has gradually been extended, managers of salesmen being appointed in various areas in control of groups, often with

other assistant managers under them, supervising the activities of smaller groups. The consequence has been the growth of a less mysterious attitude towards the salesman's task. It is increasingly felt that, given reasonably suitable material, good results can be obtained by any group of salesmen, provided the initial training and subsequent control are careful and enthusiastic.

In the light of the channels of distribution adopted, the form of the organization, and the type of customer dealt with, the administrator will deal with the policy he is to pursue in obtaining suitable personnel for his sales force. Attempts have been made to establish psychological tests which may discover, in the individual, the specific capacity to sell goods to others. But none of the tests suggested have as yet commanded any substantial scientific support, still less the adherence of the majority of business men. Selection, while improving in method, is still largely a matter of trial and error. Actual past records of success in selling goods remain the first criterion in selecting a salesman.

Such records are not, however, any assurance that he will be equally successful in teaching and supervising others. Tact and success in handling other men, a sense of organization and of the discipline which it requires, an appreciation of the company's policies, and of the necessity for adhering to them in the face of local difficulty, are even more important requirements where a man has to do supervisory work. These qualities are not the necessary inheritance of any particular social class, nor of any specific type of education. But in settling his policy with regard to recruiting, the administrator will remember that the possibilities of promotion open to members of the existing staff are a large and important factor in the incentives which the company is able to put before them to yield their best and most constant services. Young men employed by the company in a clerical capacity will often look to the sales force as a possible means of advancement. Their

knowledge of the company's policy and of its goods will make them suitable recruits for work in the field, always provided that they have the capacity to sell. Usually, the administrator's recruiting policy will represent a combination of all these factors. A proportion of his selling force will be drawn from the ranks of the organization itself, others will be chosen from applicants who have had particularly successful selling records in the same or analogous trades. He will engage a few young men of secondary school or university training who are likely to develop into successful managers.

Second only in importance to the question of recruitment is the policy to be adopted towards training. In the past, the usual practice was to send the beginner out on the road as an understudy to an existing salesman. Beyond this, there was no deliberate and formal training for his task. This method was open to many objections. The tendency of the older salesman was either to assign purely routine duties to the younger man, which did not develop his own capacity for handling difficult customers, or to rest on his oars and to allow too heavy a proportion of the work of his area to fall upon the understudy. There was lack, on the one hand, of logical and definite instruction; and, on the other, of that direct personal responsibility which is the best school for work of any kind. There is to-day a tendency for the training of the salesman to form part of the definite policy of the company and to be made increasingly systematic.

The candidate is initiated not only into the range of goods on the company's price list, its service to customers, and its general methods of trading. He is also presented with a definite analysis of the salesman's task, taught how to examine an area for selling opportunities, instructed in methods of approach to a prospect, and the way to handle complaints of all kinds. He will then be sent out for a few weeks and assigned a certain number of customers, during which period he is definitely on trial and is carefully

watched and assisted by one of the area sales managers, or sometimes by a specifically appointed instructor. His failures and weaknesses are very carefully noted, and he is taught the reasons for them and the lines to be pursued in overcoming them. Next, for a time, he will be treated as a supernumerary to the regular salesmen, and used to replace those who are absent for some reason or other, the supervision and instruction still continuing. Only after this period of careful development will he be allotted a ground of his own with full responsibility as the company's representative. But if he is a suitable candidate, the period which must elapse before that day comes is defined from the beginning, both in his own mind and in that of his employer. He is not allowed to drift along indefinitely as an assistant to another man who has no direct motive towards increasing his personal efficiency, and has sometimes very strong reasons for wishing to retain him in a subordinate capacity.

The question of the remuneration of salesmen is still a very open one. In the past, the almost invariable practice was to pay the salesman a small permanent salary, generally sufficient to cover his expenses, plus a commission on the amount of goods sold in each month. The amount of this commission tended to vary with different trades. On the whole, this method still constitutes the basic practice. But there are innumerable variations which have many adherents. Certain companies have definitely abandoned the policy of paying a commission on the actual sales. They pay their salesmen a fixed salary which is increased from time to time, partly on seniority, but chiefly on the actual sales obtained. Other firms pay commission only. Between these two extremes there is every variety of device for stimulating sales in particular directions.

From the administrator's standpoint, the commission system of payment has many obvious advantages. It is easily costed. It is an automatic and constant incentive

to effort on the part of the salesman. It is extremely flexible where it seems necessary to emphasize the importance of a particular line or product. On the other hand, it places obstacles in the way of essential changes in organization. It tempts a salesman to overstock the customer. It may lead him to take a short-sighted view of his task as a whole.

Finally, the administrator must determine the company's credit policy. In the majority of instances, a longer or shorter period is allowed to the customer in which to pay for the goods he has bought. Obviously, such a system has its risks, and every business in active operation anticipates a certain percentage of bad debts. On the other hand, a refusal to grant credit to individuals or to be reasonably accommodating with customers who are temporarily in difficulties, may severely restrict sales. Every business has to maintain a fine balance between these two considerations. Generally speaking, a definite policy is laid down under this head, as to—

1. The type of customer to whom credit will be granted.
2. The length of time for which credit will be granted.
3. The action to be taken where credit appears doubtful.

In the case of most trades, there are manufacturers' associations, or similar bodies, which maintain records of the credits of the various wholesalers and retailers in the trade, and whose services are available for consultation for joint action in the case of bankruptcies.

The Management Problem.

The general outline of the sales organization having been determined as a matter of policy, it remains for the management to create and operate machinery, both in the field, and at the headquarters of the company, which will render this policy effective.

The questions which will face the sales manager can be most readily appreciated from a brief analysis of the selling process as usually conducted in Great Britain.

1. The salesman has to find, or be allocated to, certain customers of the company. That is to say, his area has to be determined.

2. When he approaches a particular customer, he must be prepared either to describe or to demonstrate the goods of the company which he has to sell. That is to say, he must be provided with sales literature and, usually also, with samples.

3. He must also be prepared to make known to a customer the prices at which the goods are for sale, and the terms and conditions of sale. For this purpose he will require a catalogue or price list. If the company is prepared to leave some discretion to the salesman in matters of price, the salesman must know the limits within which such discretion can be exercised without destroying the company's prospect of profit on the transaction.

4. His area having been determined, he will require certain indications as to the method of travel he is to pursue. For instance, if he is to travel by train, he will need information as to how frequently he should visit each customer. The company's policy in this respect will, of course, determine the size of his area. If he is to travel by motor-car, arrangements for the purchase, upkeep, and repair of the car, and for dealing with the expenses connected with it, must be completed before he starts out on the road.

5. Before he visits any individual customer, it is usual for the company to notify that customer that he will be calling. Such notification may be sent either by the salesman himself or by head-quarters.

6. When the customer has been approached and a sale effected, he will place an order for the company's products. That order must be written out and forwarded to the company. That is to say, the salesman requires an order book, or a supply of forms for this purpose.

7. If the sales manager wishes to keep control of his salesmen, he will probably also require certain periodic

reports as to the number of customers visited, new customers approached, and so on. In addition, there will be various correspondence with head-quarters. Where it is of a routine character, it may reasonably be carried through on printed forms designed for the purpose. In addition, the salesman will require a supply of the company's stationery for ordinary letters.

8. When the order is received by post at the factory, it will have to be checked. The salesman may have entered certain items incorrectly, or departed from the company's price policy. In such cases, correspondence with the salesman, and possibly with the customer, will be necessary before action is taken to execute the order.

9. In addition, the customer's credit will have to be examined before the goods are sent to him. Machinery must be established for ensuring that, while there is no unreasonable delay, a valuable consignment is not dispatched to a customer who is unlikely to be able to pay his debts.

10. The order will then have to be passed to the factory for manufacture, or to a store-room where the goods are put up from stock. Where any large number of orders pass through the organization each day, it will be necessary to establish a system to ensure that no order is overlooked.

11. When the goods are dispatched, they must either be accompanied by an advice note, stating the contents of the parcel, or by an invoice which is a notification to the customer of the contents of the parcel and a charge for the goods. It is important that where an invoice cannot reach the customer as soon as the goods, an advice note should accompany the actual parcel, since many traders like to check in their goods as and when the consignment is received.

12. The total amount on the invoice must be charged to the account of the customer in the company's books.

13. If cash is collected on delivery, arrangements must be made for the receipt and record of that cash, before the goods are handed over.

14. The customer's account will have to be made up at the conclusion of each month, and a statement of his indebtedness to the company sent to him. This statement is a demand for payment. It may be either posted to the customer or handed to him by the salesman on his next visit.

15. Where the statement is handed in by the salesman on his visit, he will usually collect the cash and present the company's receipt for it. It will, therefore, be necessary to make arrangements for checking the cash received by each salesman against the payments into the company's account.

16. Whether the statements are presented by the salesman, or are posted to and paid by the customer by cheque, the salesman will probably be required both to use his influence with slow payers to ensure that accounts are settled as quickly as possible, and, further, to reinforce the other sources of credit information open to the company by local inquiries as to the standing of customers who owe the company money.

17. In the event of delay in the delivery of goods, goods of bad quality, or similar difficulties, there will be correspondence from the customer to the company. Arrangements must be made for dealing with this correspondence, and adjusting any reasonable complaints. The salesman is frequently involved in such issues, and care must be taken that while he does his utmost to satisfy the customer, he also adequately represents the case for the company.

It is clear that, apart from the general question of the recruiting and control of his salesmen in the field, the sales manager is very largely dependent on a successful internal organization for the solution of many of these questions. On the smooth and effective operation of this internal organization depends, to a large degree, his capacity to exercise an adequate supervision over the selling activities of the concern. In English businesses, the arrangements for dealing with customers and with salesmen from the

cash standpoint are frequently kept separate from the arrangements for receiving their orders, checking them, and conducting any subsequent correspondence. The first issue is treated entirely as a question of accountancy, and is usually allocated to a department known as the "Counting House." The detailed work of keeping check on orders and corresponding with customers is entrusted to an "Order Department," or "Entering Room." This arrangement has one great disadvantage. Two totally different departments at head-quarters are dealing with the salesman and with the customer. In certain cases, the operation has been combined, and the whole of the correspondence with each individual salesman or customer is conducted by a single individual, commonly known as a "Sales Clerk." In such circumstances, the subdivision of the detailed work at head-quarters will usually be geographical, and on the same basis as the organization of the sales force in the field. It has the advantage that the company speaks with a single voice to each of the customers with whom it is dealing, while the internal organization is represented to the salesman by an individual who can both be held responsible for error and approached personally for the adjustment of difficulties.

Whatever the methods adopted, the handling of the processes involved is a task which can only be effectively performed as the result of the closest and most meticulous study of detail. The procedures, routines, and systems must be as nearly fool-proof as is humanly possible, or a large percentage of error will inevitably creep in.

In some concerns, not the accountancy work only, but also other routine work connected with orders and salesmen is not under the control of the sales manager. It is entrusted either, as already described, to an accountant, or to an office manager. In other cases, where the control of the salesmen has been devolved on to area sales managers the processes we have been describing are divided up and conducted at branch offices. The advantages of this

latter arrangement are those arising from more intimate contact with the salesman and the customer. On the other hand, the capacity to create and control a good system for handling large masses of clerical routine is comparatively rare. It is probable that the branch offices will vary both in the accuracy and in the cost of their work. It will be less easy to set up and to maintain a high standard of clerical performance in dealing with customers. Area sales managers, whose strongest point is their power to inspire the salesmen under them, and to deal with particularly awkward cases, very seldom make good office managers, or, if they do, it is at the cost of their efficiency in the other direction.

Whatever the system adopted, the efficiency with which the work is carried out will remain of primary interest to the sales manager. Mistakes in the conduct of ordinary business routine have a peculiarly adverse reaction on the salesmen. Their optimism and drive are destroyed by petty mistakes in the execution of orders. The sales manager who desires to keep the *moral* of his force at concert pitch will start by assuring himself that the headquarters office makes the minimum conceivable percentage of mistakes. He may have to attend to this part of his work by means of co-operation with colleagues in charge of accountancy or office departments. But the balance of evidence seems to favour a type of organization in which the whole of the work connected with handling customers comes directly under the control of the sales manager. The routine side of this work is probably most effectively performed on a centralized plan. The salesmen, on the other hand, should be supervised in their selling work, and encouraged to better results by managers in touch with their immediate local problems.

Keeping the general outline of the sales process in mind, we can now consider briefly the various tasks which will fall to the lot of the sales manager. It should be noted that certain questions, particularly questions of price,

the fixing of total sales quotas, the examination of new lines and packings, have already been dealt with under the head of marketing. These activities, in English practice, are frequently allocated either to the sales manager or to the advertising manager, in addition to the duties discussed in this section.

The first main group of questions which the sales manager will have to consider are those arising from the broad administrative decisions as to the character of his organization. In the management of selling, the first step is to allocate definite duties to all concerned. The sales manager of a large concern will probably have immediately under him managers of divisions, branch managers, heads of office departments at head-quarters, and executive assistants. Then his actual selling force will probably be divided into various grades. He will have managers of groups, men on ordinary areas, special travellers, "missionary" travellers for introducing new lines, men who do not do any actual selling but are engaged on service to the customer of one kind or another, and junior travellers in training. The duties of each of these classes of executives will have to be listed and defined areas of control or operation allocated to them.

In fixing the areas allocated to the different managers and salesmen under them, he will probably be guided by materials supplied by the marketing department. Certain attempts have been made recently to establish a technique for determining areas on a scientific basis. The main factors to be considered in allocating areas are—

1. Number of potential consumers.
2. Number of potential dealers in the actual article which the company wishes to sell.
3. The frequency both of consumers and of dealers, say, per square mile of area.
4. The number of visits per annum which the salesman should pay.
5. The facilities for communication and the method of travel available.

On the first three of these questions, the sales manager can obtain information from the market research section up to a certain point. But he must re-classify and re-adapt the information to suit his own special problems. In the case of one company, the whole of Great Britain has been carefully divided up into one-day areas, or sales units, as they are called. That is to say, every potential user of the company's products in every square mile of the country has been marked down. These potential customers have then been grouped into units of such a size that, taking into consideration the travel facilities available, any one unit can be completely covered by a sound salesman in one day. In cases where the company's trade is not developed, or competitors are strong, a salesman may be given as many as two hundred or three hundred units, though he is expected to visit customers once a month. That is to say, until he can obtain new customers in the poorer units, he will not have sufficient persons to call on to cut his units down to twenty-eight, or one per day throughout the month. The salesman is, however, given special encouragement to develop each of his units up to 100 per cent. At the same time, there is a clear understanding that immediately his ground has become too heavy for him to work it efficiently, certain units will be handed over to other salesmen on reorganization. However scientific or however elementary the principle adopted, the area of each salesman's activity must be clearly defined. There is no more fruitful source of friction and bad working in a sales force than constant complaints from one or other of the salesmen that a colleague has "stolen" certain of his customers.

Similar to the duty of allocating the areas of the individual salesmen is the sales manager's work of combining those areas into groups, or, as they are sometimes called, "territories," under charge of a senior salesman or "territory manager." These groups or territories may again be combined in large organizations into "divisions." The

scope and extent of the authority of every executive officer and the boundaries of his activity should be clearly defined in writing in each case.

The problems of location are of the same character. Within his area, the salesman must be located at a definite point. A permanent address is necessary if the company is to keep in touch with him. The allocation of groups of special customers to specialized salesmen must be evolved along the same lines of detailed inquiry as the allocation of geographical areas to general salesmen.

If it is decided that branch offices shall form part of the selling organization, the sales manager has to decide many questions in connection with them. These include their location, their staffing, the sales he will expect from them, the cost of running them, the territory they are to serve, their operating methods, and their methods of delivering goods. He will be wise to establish standard practices for all branch offices covering these points.

Still in connection with organization, he will have to maintain the necessary records of the whole of the managerial and other personnel employed in the selling force. For each individual, he should have readily available at least the following particulars: age, education, length of service, previous employment, salaries paid and bonuses earned, present position and location, and grading in the organization. He must be prepared to consider, at any time, the strong and weak points of particular persons. He should make systematic arrangements for a periodical review and audit of his personnel. He must be prepared for a reorganization and re-arrangement of the selling staff. Such reorganization may have for its object consolidation and reduction in the number of departments concerned with selling. Should such a plan be adopted, he must make arrangements for the study and analysis of individuals in the new form of organization, and for the establishment of standards and tests of efficiency.

Under the heading of sales control, the sales manager

will first concern himself with the quota allotted to each salesman. The total quota will be set by the marketing department, should such exist. But the division of that quota and the careful planning of sales to individual salesmen should be carried through by the sales manager's department. He will have to be ready to offer suggestions on the development and improvement of selling methods. He must be prepared to co-operate with the marketing department in formulating price policies, and take the necessary steps to see that these policies are carried through by the sales force. Under the question of prices will be included such difficult matters as sales "on return," and the adjustment of discounts. He will have to arrange to deal with special terms called for by customers and with goods returned as below quality, or complaints on other grounds. He must study the company's service to its customers and be constantly seeking to improve it.

In maintaining control of his salesmen, he will require very detailed figures of the results obtained. These may be provided by a special section working under the sales manager, or by a statistical department under a statistical manager, working side by side with the sales manager, but also responsible for all the other statistics required by the enterprise. The total volume of sales must be analysed under at least three heads—

1. By the different lines on the company's price list.
2. By the different departments of the company's production.
3. By the salesmen.

In addition, he will be wise to obtain information on—

- (a) The sales to each customer.
- (b) The sales to each trade in the various territories.
- (c) The business his salesmen are not getting, and why.
- (d) The distribution of each salesman's figures as between high and low profit lines on the company's list, and between customers buying at trade prices and those buying at some special discount.

(e) The distribution of the sales by counties, cities, or towns, and by wholesale and retail customers.

It will be helpful if, for each customer, he can have an analysis of their annual or monthly requirements, the volume of the sales in cash and also the volume in units. All these figures will have to be provided in parallel form, so that he may maintain his grip of the situation by constant comparisons between the figures of the current year, the figures of previous years, and the standard or quota at which he is aiming.

Another group of figures the sales manager must study are those relating to the expenses of the departments and sections under his control. He must know—

1. The capital investment involved.
2. The current outlay at reasonable intervals, say, every four weeks.
3. The previous year's expense figures.
4. The current rate of expense expressed as a percentage of sales.
5. An exact analysis of the expenses charged to the sales department.

He will require comparative figures of the cost of selling and the travelling expenses involved for each of his salesmen. In addition, he will be wise if he can see that cost of selling distributed in various ways, as a total for the company, by the various lines of merchandise, by divisions or departments, by branches, and by salesmen. He will require to have the statistics of sales results put before him to show certain special factors.

1. The seasonal variation in the total of sales.
2. The rate of profit on the lines he is selling.
3. The movement of slow-selling lines.
4. The extent to which the most important lines on the price list are distributed in certain areas.

He will be wise to list up his customers into various grades, showing those who should be called upon at least once a week, others whose requirements can be satisfied

by a call every thirty to sixty days, and yet another class who will be satisfied with a call every three to six months.

In the selection and training of his salesmen, he will have to make definite arrangements to set up standards for selection. He must also establish a procedure for considering and dealing with applicants. He must decide whether to see all applicants himself, or to delegate the power of selecting men to his area sales managers. In the latter event, he will be wise to establish certain principles which must be observed before men are placed upon the company's staff. His training arrangements will cover the various different classes of salesmen already listed under the heading of organization. The training may be of two kinds—

1. Theoretical training in schools.
2. Training on the job.

Training in schools may be carried out either at the head-quarters of the company, at various points in the different area sales managers' divisions, at branch offices, or at the factory. If the training is to be systematic and practical, the sales manager will have to gather material for this purpose. Four main methods are open to him—

1. The analysis of complaints and difficulties encountered by salesmen and dealers in the field.
2. The collection of facts as to the best methods of his star salesmen.
3. The use of questionnaires addressed to salesmen and to wholesalers handling his lines.
4. An analysis of the actual interview between the salesman and the customer from the standpoint of efficiency.

Once his salesmen are out on the road, he may develop the process of training by one of two main methods—

1. By the issue of printed instructions from head-quarters in the form of a sales manual.
2. By conference.

The sales manual may be designed either for the company's own salesmen, or for the use of wholesalers handling

the company's lines, or for both. It will usually contain a statement of the company's sales policy, and complete lists of the selling points of the company's chief products. In the United States, sales manuals are frequently illustrated and very attractively produced. A weekly bulletin of information and encouragement may also be issued to salesmen from head-quarters.

Conferences may be either local or central. For local conferences, the sales manager or his assistant will visit the head-quarters of the various sales areas and meet a few of the salesmen for the discussion of policies and difficulties. Local conferences are easier to handle, and do not occupy the time of a number of salesmen in traveling. Central conferences at the company's head-quarters or factory may be organized for the whole body of salesmen employed by the company, or may consist of more frequent smaller gatherings where a group of a dozen salesmen are collected in from the different areas. Many enterprises hold an annual sales convention where all the men from the different areas gather together at head-quarters for two or three days to compare notes and to listen to addresses by the sales manager and the sales director. Considerable difference of opinion exists as to the comparative value of these various methods of training and encouragement. But one point is clear: that the personal contact, whatever its form, between the sales manager and his area sales managers and salesmen, is the point at which the efficiency of the sales force is made or marred. Bad organization at head-quarters will discourage and hamper an otherwise enthusiastic sales force. But without constant personal contact with the officers at head-quarters, no sales force will begin to develop a glimmer of enthusiasm.

The sales manager will devote considerable time to the necessary equipment of his salesmen, not only with sales manuals and catalogues, but with samples of the company's product and suitable media for carrying them.

Where the salesmen use motor-cars, he must make arrangements for the selection of a model well-designed for the purposes concerned, for the effective equipment and maintenance of the cars, and for the control of expenses arising from them.

Lastly, on the internal side of his work, he will find himself incessantly in contact with other executives in the organization. In a large concern, his duties will bring him into constant relation with the transport manager, over the delivery of goods ; with the marketing manager over prices, goods, and policies ; with the advertisement manager, in the integration of sales and advertising efforts ; with the accountancy man over credits ; and with the office manager, in the conduct of the internal routine. His success in providing the company with a really efficient selling organization depends largely on the amount of time and thought and tact he can devote to rendering such contacts co-operative and dynamic. A sales manager who is a brilliant organizer, who can fill his salesmen with enthusiasm, who can inspire new ideas for selling and see them carried to perfection throughout a large sales force, has only done a part of his job. His results may be satisfactory. But they will be by no means the best results of which the enterprise is capable, unless he has added to all these qualities a genius for co-ordinating his work with that of others, for mapping out a campaign and appreciating exactly how the fullest value may be obtained from each particular factor of effort. This is, of course, true of all executives. In every large organization, the results of real team work far exceed the aggregate of the most brilliant individual performances. But it is particularly important in the case of the sales manager. More incessantly than any other executive, he is spurred by the daily, weekly, and monthly demand for results. This, in itself, unless he is exceptionally sympathetic and well-poised, is apt to make him careless of the interests of other departments and impatient of the checks which effective

co-ordination must necessarily impose on his individual activity. Apart from this, the very qualities which make him a successful and inspiring leader of salesmen, originality, a strong personality, the power of dominating difficult situations, are a danger in contact with colleagues whose strength lies along other lines. For these reasons, the internal part of a sales manager's duties should always receive his own special attention, and be the subject of constant watchfulness on the part of the administration.

2. TRANSPORT

It has been said that "civilization is transportation." In many of the activities of our modern social economy, and particularly in deciding competitive advantages, transport facilities are often decisive. The tendency is to throw upon the producer an increasing responsibility for the physical transfer of goods to the place of sale, and upon the seller for the delivery of the goods to the place of consumption.

The most influential factor in the transport problem of any particular manufacturer is whether his goods are staples made in advance of sale "for stock," or more specialized products made only "to order." In the case of the staples, promptness of delivery becomes a very powerful influence on sales. Where perishable articles are concerned, this consideration has to be balanced against the necessity of ensuring that the goods are fresh when they reach the consumer. Other important issues from the point of view of transport are—

1. The money value of the product in relation to its weight and bulk.
2. The distance of the factory from the principal markets as compared with those of competitors.
3. The number of times the goods are handled in the chain of distribution.

The Administrative Problem.

In the case of an established factory, the administrator has to consider three main problems in relation to the transport of his goods to his customers and consumers. If he is manufacturing to order, it is probable that time will not be of primary importance. He will be more concerned with cheapness and the existence of means of communication to his principal markets, which permit of the handling of heavy goods with the minimum of expense. In the case of the manufacturer of staples, however, time will be of the essence of the problem. In the case of the requirements of normal domestic existence, the consumer looks to the retailer in the next street to supply him immediately. This involves the maintenance of varied stocks, often of perishable articles.

From the manufacturer's standpoint, it involves prompt and immediate delivery to the retailer of any article upon his price list. If he cannot satisfy his customer as to his deliveries, he will lose business to a competitor who can.

The kind of service which the retailer expects varies, from trade to trade and from district to district. But, generally speaking, in any large centre of population, the retailer of staple commodities looks to receiving the goods into his shop on the same day on which he places his order, or, at the latest, on the following day. He will regard it as a great convenience if there is a depot or warehouse which he can call by telephone. Such promptness of delivery cannot, as a general rule, be obtained by means of railway transport, save where the retailer is on a main line and close to the receiving station. Large manufacturers have, therefore, been led to the establishment of depots or warehouses at different central points in the British Isles, from which goods are delivered by motor direct to their customers in all the larger centres of population. Again, where the manufacturer is distributing direct from his factory, and not through depots, the dispatch of goods by train involves a double handling. The orders

have to be packed and placed in trucks at his own factory, and then unpacked from the train, loaded on to the railway company's delivery wagons, and transported to the retailer in detail. On the other hand, by loading up road vehicles at his own works, and arranging their journeys, the manufacturer can deliver in detail to each retailer, always provided that these customers are sufficiently close to his factory to enable the vehicle to make a suitable round journey in the day. The establishment and maintenance of depots, and also, in the majority of instances, delivery by road vehicle, are on the whole more expensive than the railways. The main administrative problem which faces the manufacturer in connection with transport policy is, therefore, to strike the right balance between the time factor and the expense factor, in deciding his methods of delivery.

The second main question with which he will have to deal depends on his reply to the first. If he has decided to employ a proportion of road vehicles for purposes of road transport, he will be immediately faced with the problem of the care, control, and maintenance of those vehicles. Two main courses are open to him. He may own his own fleet of lorries, establishing his own special transport controller, repair shops, and so on. On the other hand, he may employ a transport contractor who will run a fleet of vehicles for him under some arrangement. The nature of these arrangements vary. A typical form is a contract to convey all goods at an overall flat rate per ton per mile.

Experience of road transport on a large scale is as yet hardly sufficient to determine which of these principles is likely to prevail. The tendency in this country has been for manufacturers to purchase and control their own vehicles. On the other hand, it is increasingly recognized that the control of road transport is a very highly-skilled and technical profession. Unless a manufacturer is in a big enough way to own a very large fleet of vehicles, he

cannot usually afford the employment of a sufficiently skilled manager to ensure that his operation costs are kept to a minimum. Again, the main problem in the use of road vehicles is to obtain return loads. Most of the costs of operating a motor-lorry apply equally whether it is running full or empty. Here, again, the individual manufacturer with his own vehicle is in a disadvantageous position as compared with the contractor, who is closely in touch with the whole of the transport possibilities of the areas over which his lorries operate. The possibilities of loss in running a small transport fleet with inadequate technical control are enormous. In one case, quite a small business had been operating a fleet of three or four vehicles. As the result of difficulties, a firm of expert transport accountants were brought in to investigate the situation. They proved conclusively that, over the course of the previous eighteen months, more than £5,000 had been wasted owing to inadequate methods of transport control.

The third question which will come before the administrator are the methods to be adopted for storage and dispatch. In the majority of cases where large stocks have to be maintained for the normal day-by-day supply of customers, the control and arrangement of the stock-rooms will fall within the scope of the transport function. It is possible, also, that the internal transport of the factory may be dealt with under the same authority. In any large organization, there are constant opportunities for improvement in such methods. The mechanical handling of goods is a wide and specialized study, to which increasing attention has been given for the last fifteen years. The administrator will have to consider constantly the possibility of substituting mechanical for human effort in all the processes connected with the receipt, storage, transfer, and dispatch of goods. Mechanical transport may take the place of horse transport, or vice versa; horse transport is still cheaper for very short hauls in which there is a large proportion of waiting time. Mechanical vehicles with detachable

bodies may be substituted for those with fixed bodies. This will reduce the investment in vehicles by enabling expensive chassis to be operated continuously with a minimum loss of time in loading and unloading. Steam, petrol, or electric tractors, with trains of trucks, may be substituted for single vehicles mechanically or hand operated. Again, trucks of all kinds may be scrapped in favour of mechanical conveyers carrying goods continuously from one process to the next. In the handling and piling of the stock, the same principles apply. Mechanical elevators may be substituted for teams of men walking up and down ladders under heavy loads.

Where goods are sent long distances, the method of packing requires the most careful and intensive study. Huge economies may be effected by substituting fibre or other packing material for wood or metal cases. These questions the administrator will not consider in detail for himself. But it is his duty to keep alive to the developments of modern methods, and constantly to help and encourage the management to experiment with those which may seem suitable for adoption.

The Management Problem.

The problems to be faced by the transport manager are determined by the policy laid down by the administration. But primarily he must be an expert in all the various methods of transportation open to the company. It is for this reason, more than any other, that the tendency to place the control of mechanically-propelled vehicles under contract is on the increase. A man cannot be an expert in railway rates and methods, water haulage, the various forms of road haulage, stock storage, conveyers, and similar mechanical devices, and at the same time be an expert mechanical engineer, specially skilled in the control and operation of a large fleet of motor vehicles. It is not impossible, of course, to find such men, but if they are also able executives, capable of managing and controlling

a considerable staff, often widely scattered, they will be costly. The transport operations of the majority of businesses are not usually on a sufficient scale to justify the engagement of such a man. A cheaper man called upon to fulfil all these different functions is very apt to be extremely defective in one or the other direction. Money is wasted, either because he has an insufficient acquaintance with alternative methods of transport, or because he lacks the necessary technical skill adequately to control the operating costs of the fleet of lorries or similar vehicles.

The actual duties falling upon the transport manager are those involved in—

(a) The receipt and storage of raw materials required by the company.

(b) The conveyance of those raw materials from the point to which they are delivered by the seller to the factory.

(c) Their distribution to the point of use within the factory.

(d) The storage of the stocks of finished goods.

(e) The assembly, packing and dispatch of all goods ordered by customers.

(f) The control of the staff engaged in these operations.

(g) Where the company has a number of depots, or warehouses, in different parts of the country, the management of these depots and the details of their operation.

He will have to arrange for the maintenance of the necessary records. These fall into two main classes—

1. *Records of operating costs.* In any large organization these are extremely detailed. The actual work of maintaining the figures will usually be undertaken by the costing or statistical department of the enterprise. The transport manager must arrange for the basic figures to be taken out in a form which will present a true picture of the expense actually involved in each operation. He will necessarily confer with the costing and statistical manager as to the final shape in which his figures of costs should be presented.

2. *Records of goods handled.* Particularly where the company's property is entrusted to other carriers, the transport manager will need to be in a position to present prompt claims for any loss or damage in transit. In dealings with the company's own customers, it is essential that proof of dispatch and delivery should be readily available.

In compiling records of the second class, he will be chiefly concerned with companies engaged in rail, water, or road transport. Consequently, he must be well acquainted with the Carriers' Act, and with the whole legal position of traders in relation to transport enterprises. In Great Britain, the question of railway rates for different classes of goods is a matter of great complexity. The transport manager is responsible that each lot of goods sent by rail is accompanied by a correct consignment note. He must see that the description of the goods is such as to ensure their being charged in the class most suitable to the company's requirements, within the regulations published by the railway company concerned. He must decide, with reference to different classes of the company's goods, whether they should be sent at the railway company's risk or at the trader's risk. He must establish machinery for prompt settlement of complaints from customers as to non-delivery.

Should the company have decided to maintain its own fleet of transport vehicles, he will also be responsible that these are operated with the minimum of idle time and the maximum of economy. We will have to arrange that deliveries over an area are properly routed, so that the vehicles travel the shortest possible distance with the largest possible load. When a vehicle has to be repaired, he must devise methods by which the time thus occupied is as short as possible. Many large users of mechanical transport arrange for a system of standardized vehicles, and standardized parts. As a vehicle comes into shop for repair, the damaged part is immediately removed and a substitute

replaced, so that it is on the road again within a few hours. The damaged part is then repaired and placed in stock against the next breakdown of a similar part of a vehicle.

Where goods are arriving for the factory by water or by rail, the transport manager will be responsible for arrangements for unloading them promptly. Neither shippers nor railway companies provide holds, trucks, and warehouse accommodation to be used by traders for storage purposes. Any delay in clearing goods from their terminals will involve heavy charges for demurrage.

Where the company maintains warehouses, the effective control of these outlying establishments involves all the problems common to the management of branch enterprises. The transport manager will have to select suitable persons to be in control of each unit, to make arrangements for the recruitment and control of staff, to hire or purchase buildings suitable for the storage and dispatch of goods in that particular locality. If his goods are perishable, the depot buildings must be of a type which can be maintained at the correct temperature for the proper maintenance of the goods. He will pay particular attention to the question of double handling. The additional loading and unloading of goods is probably the most important single item in the whole cost of transport. His depot will have bays or docks where consignments of goods, collected against customer's orders, can be wheeled directly at loading height on to the floor of lorry or truck. If the main factory is provided with a railway siding, it will be an immense advantage if the depot can be constructed so that truckloads of goods in bulk can be run directly into the depot premises and unloaded there without further transhipment. Similar considerations apply to water carriage.

The essence of the task of the transport manager of to-day is to arrange for the storage and conveyance of goods from point to point with the minimum of cost and human effort. In addition to a general knowledge of methods of handling staff, of controlling expenditure, of organizing a complex

series of related actions, he must possess a technical grasp of the various methods of transport. At the moment, these are broadly confined to rail, road, and water. How far transport by air for commercial purposes will develop in the coming decade, it is idle to prophesy. But within the means already at his disposal the transport manager has many alternative routes, rates, vehicles, methods of handling, and speeds of transit. Upon the skill with which he combines these alternatives for conveyance of the company's goods will depend his usefulness to the company.

3. CO-ORDINATION

From what has been said of the different activities involved in the whole process of distribution, marketing, advertising, selling, and transport, it is clear that they interlock with each other, and with other departments of any large organization at many points. The marketing man must be in constant touch with production, on methods of packing goods, and on the quantities to be produced. He will be concerned with advertising, in relation to the packing of goods for the purposes of display. He will be in touch with selling on the whole question of the available markets and the quantity of goods which they should absorb.

Similarly, the advertising manager will be in touch with selling over the display of goods and the synchronization of special advertising and selling campaigns. He will be in touch with transport, over the conveyance and storage of advertising material required by customers or by his own staff of window dressers. He will be in touch with marketing, as already indicated in the design of new packages and similar matters. Selling will be in constant contact with transport over deliveries and complaints by customers. Special efforts will be required to clear stocks which have hung fire in certain areas. The closest liaison between the salesmen and the depots will alone ensure a

first-class service in the delivery of goods. Transport will be in contact with production over the receipt of goods. It will refer to the engineering or technical departments for the maintenance of its vehicles, conveyers, and similar equipment.

Thus, the whole distribution machinery involves a criss-cross of human activities carried out by various individuals, the very nature of whose work ensures that they will be of somewhat different outlook and character. The task of co-ordinating these activities, and ensuring that real team-work replaces individual effort, is the supreme responsibility of the man in charge of the distribution activities of the enterprise as a whole.

On the administrative side, such co-ordination is probably best attained by means of conference. Conferences held at frequent intervals provide a means by which the policy, both in the course of its determination and when finally decided upon, may be clear to all who are responsible for taking part in its execution. Detailed difficulties are brought into review at the earliest possible stage. Managers are not left to feel that their particular trials have been ignored in the determination of policy.

A second method of ensuring co-ordination is the publication of written information at frequent intervals to all concerned in distribution activities. This information in the form of a weekly bulletin, or letter, can be duplicated in large numbers, and distributed right down to the individual salesman or the subordinate at a depot. Here, again, is assurance that every one concerned is aware both of the nature of the company's policy and of the executive action which it demands.

A clear-cut organization with a definite line of control is essential to the successful functioning of any complex piece of machinery. Only when duties are clearly defined, overlapping activities are provided for by definite means of adjustment, and each individual in the whole structure understands his position and the exact nature of his

responsibilities, is it possible for co-ordination to be really effective.

On the management side, successful co-ordination will be achieved mainly along three lines. In the first place, there must be a clear understanding as to methods. In any large concern the methods of dealing with orders, of assembling them, of dispatching them, and so on, should be standardized. In addition, steps should be taken to ensure that every individual in the sales force, on the advertising staff, and on the transport side, appreciates what those methods are and how they work. It is never sufficient for a man merely to understand the routine which concerns himself or his department. If co-operation is to be developed, he must have a rough-and-ready working knowledge of the organization and routine of the departments with which he comes in contact in his daily task.

Apart from the question of standard methods, the other vital factors in executive co-operation are time and space. Work of all descriptions, in which various departments have to co-operate, must be planned in both these respects. An individual or department, however enthusiastic, cannot carry out work within a scheduled time if another department on which it is dependent does not pass on the particular task soon enough to allow for its completion. In the same way, the depot which will hold 1,000 tons cannot handle a sudden expansion in sales involving a stock of 1,500 tons. An advertising department cannot launch a campaign unless it has sufficient warning to prepare copy, to book spaces in the Press, to correct proofs, and so on.

These statements may seem to be mere truisms. But with the sudden and rapid growth in the size of the business unit which has characterized the last twenty-five years, failure to appreciate their importance has led to much waste. Even to-day, the necessary conditions of effective joint action, especially on the executive side, are insufficiently understood in British business. In this matter, of time and space, no large distributive organization can

operate successfully unless it works to a definite programme established in advance, and to which all departments conform.

Management devices of this description cannot, of course, replace that willingness to work together which we call "esprit de corps," and which is the direct result of good personal leadership. In certain instances, a good atmosphere in a works will overcome countless defects in the organization and management. But in the long run, for distribution as for production, or for any other business activity, sound forward planning and effective enforcement of logical organization is essential to continued efficiency. It is only in an environment so determined that corporate effort, inspired by goodwill, can yield its most far-reaching results.

CHAPTER VII

RECORDS AND COSTING

BY J. W. WARDROPPER

1. RECORDS AND STATISTICS

THE scientific administration of modern business makes accurate and comprehensive statistics and reports a necessity to the management. The larger a business, the more complex becomes the system by which the various transactions are recorded, from the engagement of the labour force and the purchase of raw material, until the goods are sold and payment received. The business of necessity becomes departmentalized with increase of size. Those who direct the enterprise tend to become removed from actual contact with the realities of the workroom, and increasingly dependent upon reports and statistical information, which preserve the results of past experience. Moreover, the factors which make for success or failure have increased in number and complexity, and have become more difficult to estimate. Facts external to the business, such as price and market movements and marketing possibilities at home and abroad, need to be known and related to the internal facts and policies of the business.

It has been pointed out that the function of the managing director of a business is to keep in constant touch with every part of his organization through the medium of constant channels of incoming information from every department, to originate plans and policies affecting the organization as a whole, to execute his authority in keeping the various parts harmoniously adjusted, and to test their efficiency in achieving standard practice.

Their Value to a Managing Director.

His first step in so doing is to see that the financial accounts of the business are presented in such a form that

the expenses chargeable against each department are subject to the control of the head of the department. Many expenses which are allocated or charged out to departments are not subject to the control of the departmental heads. Take, for example, the cost of repairs to machinery in a factory where the maintenance of equipment is under the control of a plant engineer. In any accounting period the works manager may find that he has been debited with increased charges for repairs and has exceeded his estimated expenditure. This may be due to the greater volume of repairing work necessary, in which case the charge is legitimate. On the other hand, the wage rate of fitters, millwrights, etc., may have varied, the costs of engineering material may have advanced, the efficiency of the administration of the maintenance department may have declined, and in such a case the responsibility does not rest upon his shoulders. Such difficulties arise every day, and careful inquiry is needed to fix the responsibility for the increased expenditure.

The main subjects on which the managing director should call for statistical information will be—

1. The gross profit, i.e. the margin between selling prices and costs.
2. The net profit, determined by the regulation of expenses.
3. The investment in stock of raw materials, work in progress, and finished goods and the rate of turnover.
4. Expenditures for additions and alterations to plants, improvement of equipment, cost of maintenance and repairs.
5. Availability of capital.
6. The management of the plant in such a way as to—
 - (a) Avoid decrease in unit production.
 - (b) Avoid increase in unit cost.
 - (c) Maintain satisfactory labour conditions and steady employment through the year.
7. The volume of sales and production.

The study of such reports will show up inefficient administration, misdirected sales effort, a lack of inter-departmental co-ordination, or other matters needing correction. In the same way, departmental officers who desire to keep their actual expenditure within the budget estimates, will need to call for more detailed reports dealing with the various activities under their control.

The Value of a Costing System.

The manufacturing executive will require reports to keep him in touch with the numerous activities of the factory. He will expect the factory costing system to be designed to give him the cost of any article manufactured, account being taken of current material prices, wage rates, and operating efficiencies. If he is manufacturing machines of a standard type, comprising hundreds of parts, and requiring thousands of operations, he will want to know promptly what each will cost to build. If a special order has been undertaken, he will want to know during the job whether the cost of manufacturing is running in excess of the estimate on the basis of which the quotation was made, so that he can take the necessary steps to improve the position. He will expect to have periodical reports showing comparisons of actual cost of operation with predetermined standards, divided under such headings as—

Material by classes.

Labour by departments, sections and types.

Spoiled work by departments.

Cost of power by departments.

Cost of transporting and handling material and work in progress.

Incidence of miscellaneous shop charges.

Running time of machines, etc.

He will expect the operation of the costing system to reveal to him the efficiency of the factory as a whole, and to have the report so compiled that if an unsatisfactory position be revealed, he can trace back the responsibility

through departments and sections, even to the individual operator. In the same way he will require that the root causes of increases or decreases of cost be attributed to variations in such items as—

1. The purchase price of material.
2. The efficiency in the use of material.
3. The rate of wages.
4. The time taken in manufacturing.
5. Machine efficiency.
6. The cost of power.
7. The efficiency of the use of power.
8. The amount of spoiled time, idle time, etc.
9. The amount of overtime or short time, night or shift work.
10. The cost of shop supplies, indirect labour, etc.

These statistics, with others relating to the operation of the factory, should be compiled periodically (daily, weekly, or monthly) and presented to the works manager, and in summarized form to the board of directors. Wherever possible, in presenting statistics, use should be made of a chart or other graphic form of representation, so that the time of the executive officer may be economized. Considerable saving of time can be achieved if the results are arranged so as to "signal" in some way when attention is required, and thus make it possible for the executive to find from a mere glance at a chart that a whole group of complex transactions is proceeding satisfactorily.

Value of Statistics to a Sales Manager.

In businesses manufacturing a regular line of products, and selling these over a wide field, the sales manager, charged with the responsibility of the control of the salesmen in the field, and the amount and nature of the advertising expenditure, needs to have at his disposal a very complete statistical system to enable him to control the selling side of the business. In the first place, he will want to know as soon as possible the total sales of each class of

product (weight, number and value), divided according to the main territories covered. Further, he will want an analysis of the sales arranged according to class of goods. In certain trades it is important for the sales manager to know the extent to which the trade of individual customers is being held and developed, and in such cases he will require particulars of the sales of individual customers.

Mechanical Devices for Compiling Data.

Where the nature of the product sold does not permit of manufacture for stock, it may be necessary to base the production programme upon the current sales. In such a case an analysis of the goods sold by line, size, and package, will be required for the guidance of the factory. In any large organization, the task of compiling such statistical sales information will be very burdensome, unless some mechanical method of working up the figures is used. If the number of lines sold, the number of travellers, or the number of customers on the books is large, it is impracticable to attempt to compile the statistics by hand sorting and totalling, and use must be made of the Hollerith or Powers sorting and tabulating machinery. Manilla cards, measuring $7\frac{3}{8}$ in. by $3\frac{1}{4}$ in., are printed with 45 vertical columns of figures, numbered 0 to 9. These columns can be divided up into fields, according to the nature of the information which it is desired should be punched on the cards. The primary information is coded according to a numerical code. In connection with the compilation of sales statistics the essential information relating to each sale will include the date (day, month, year), the traveller's number (this will also indicate districts), line (department, section, class of goods), size or other identification, number (of items sold), weight (if sold by weight), customer's reference number, value of goods. This information for each sales item has to be punched by a machine on a separate card. The cards can then be mechanically sorted into any desired sequence or groups at the rate of 20,000

cards per hour per column. The sorted cards are then placed in the tabulator, whose function is to reproduce the figures represented by the holes which were punched in the card and add them together with great rapidity and absolute accuracy. The cards can then be re-sorted for the purpose of taking off further information. When the information recorded on the primary records has to be sorted in more than two ways, the use of these machines is abundantly justified, and they can, of course, be used for other purposes than sales analysis, e.g. compilation of pay roll and labour cost analysis, etc. The reports yielded by the use of these machines will enable a sales manager to gauge the efficiency of his individual salesmen, for he will be able to note systematically how far he is getting distribution of the goods in the territory he covers. He will be able to plan his advertising programmes and special sales campaigns in the light of previous sales records, and test the value of the methods employed by the actual sales at a later date. Extension of trade and the discovery of new outlets for the product depend upon market research, which is largely a matter of statistical investigation and report.¹

In a small business, such detailed analysis of the facts relating to sales would probably not be warranted, but some system of sales analysis will be necessary, for the guess, even of an expert, is not so valuable as carefully ascertained facts.

Ensuring Accuracy and Value of Statistics.

The degree of accuracy of the data on any records or reports limits the successful use of them. It is important, therefore, to plan the form of the records so that it will be easy to make accurate entries. The information should be supplied easily and by simple methods, and should be correct and complete. Automatic or mechanical recorders have a distinct value when correctly installed, and are positive evidence of performance, especially when such

¹ See Chapter V for fuller treatment of this subject.

facts as time, temperature, weight, etc., form important items in records. Trouble always characterizes any system of records which depends upon the workman filling up his own time cards. In the first place, doubt and suspicion as to the use that might be made of the information recorded lead to reluctance to complete these forms properly. Even if automatic clock recorders are installed for the purpose of getting an accurate allocation of time, there is a danger that a man will not clock off one job until he sees another waiting for him. To throw the onus of filling in the time records on to the foreman is not a complete solution of the difficulty. Foremen are not anxious to reflect upon their powers of organization by recording such items as idle time, waiting for work, etc., which may happen to occur among the workers in their charge. A record of itself does no good unless action follows upon what it reveals. This means that records must be up to date and rendered on time to all the parties concerned, so that appropriate action can be taken at the earliest possible moment. Such considerations as these point to the necessity of taking steps to ensure that the primary data which is afterwards to be worked up into comprehensive reports, and on which vital action is to be taken, should be carefully and completely recorded.

2. COSTING

The Balance Sheet of a Company.

The Companies (Consolidation) Act, 1908, requires that—

“Every company shall at each general meeting appoint an auditor or auditors,” who “shall make a report to the shareholders on the accounts examined by them, and on every balance sheet laid before the company in general meeting during their tenure of office, and the report shall state—

“(a) Whether or not they have obtained all the information and explanations they have required ; and

“(b) Whether, in their opinion, the balance sheet referred to in the report is properly drawn up so as to exhibit a true

and correct view of the state of the company's affairs according to the best of their information and the explanations given to them, and as shown by the books of the company."

This provision in the Act is designed to safeguard the interests of the investing and general public, and ensures that once a year a statement shall be presented giving a view of the relation between the assets and the liabilities of the business at the date the audit was made. The balance sheet is supplemented by a trading account and a profit and loss account. The total expenditure for the year is compared with the total earnings or revenue of the concern, and an estimate is made of the profits earned during the year.

Even with such restricted information before him, a business executive can benefit as well as the public from a study of the expense items and the relation of the expenses of manufacture, distribution, and management, especially if he makes comparison with trading results of previous years. It will be obvious, however, that these statements are not pertinent to the acute problems arising from frequent changes in market conditions and calling for quick decisions. The information afforded by the annual trading accounts and balance sheet must be supplemented by a system of cost accounts in order that a continuous moving picture of the changing fortunes of the business may be presented to the eye of the executive.

Opposition to Control through Cost Records.

In some large organizations accounting is regarded as a sacred mystery beyond the understanding of the operating man in the factory. But this view is changing, for accounts designed and regarded as part of the everyday working tools of the manager can afford guidance to anyone who will take the trouble to use them. It must be recognized, however, that there still exists the type of manager who asserts that he knows the most economical methods by instinct, and who looks with some contempt upon any

suggestion of "running a business by figures and records," exhibiting a strong reluctance to substitute precise knowledge for the chance impressions which have largely determined his actions in the past. This disinclination to perceive any value in statistical records probably arises from inertia, or may even be the result of bitter experience of over-elaboration of records. If reluctance is to be transformed into active co-operation, the objections of such a manager must be examined and arguments advanced which will convince him of the advantages to be gained from the installation of a costing system.

At the outset, too often he finds himself handicapped by the man with command of figures, and the efficiency of his administration too frequently measured by book balances and statistical reports, rather than by expert inspection of actual performances. He is entitled to demand a sympathetic treatment based on technical knowledge and sympathetic understanding of his particular difficulties, so that criticism of his work shall be constructive and informed. Criticism based on statistical returns lacks these qualities, though a well-devised series of cost figures will enable him to measure the efficiency of his own administration.

Some businesses are suffering from a veritable surfeit of information, especially that which consists of a mass of figures or data in which the few vital grains are lost in a load of chaff. It must be remembered that the value of information—like that of food—is limited to the extent to which it can be digested. Unnecessary information represents a double loss; firstly, in the cost of its compilation, and secondly, because a mass of unnecessary and irrelevant data prevents a proper consideration of the vital information with which it is blended. Furthermore, over-elaboration of records makes prompt returns a virtual impossibility, and there is a natural dissatisfaction with systems which give results too late for action to be taken. It is important that the manager's time should be conserved by arranging the records submitted to him so that the

points needing his attention should stand out. This can be done by graphic representation of facts or by the presentation of a report form calling attention to the special features which demand attention. In this way a costing system can be proved an aid to management.

Further, a costing system can help greatly provided it functions effectively in time of adversity, when it is most needed. There are two leading theories as to what cost consists of. They are—

1. That the cost of an article must include all of the expense incurred in producing it, whether such expenses actually contributed to the desired end or not.

2. That the cost of an article should include only those expenses actually needed for its production, and any other expenses incurred by the producers for any reason whatever must be charged against some other account.

When plants are operated at their full capacity, both theories give the same cost. In times of business depression, when the attempt is made to charge current costs to current production, abnormally high unit costs result, leaving the administrator the alternative of utterly disregarding his cost figures, or of setting prices so high as to throttle business just when there is most need to expand it. But, when costs are figured on the second basis, a works manager is incited to see what can be done to put this plant into operation, realizing that this machinery had better be operated, even if only the expense, or even part of the expense, of maintaining that machinery is earned.

Elements of Cost.

The cost of an article is the sum of all the expenses involved in its production. The elements which make up manufacturing cost are—

1. Labour—direct and indirect
2. Material—primary and secondary.
3. Overhead—known also as oncost, burden, factory expenses, fixed charges, or establishment charges.

Administration and selling expenses need to be added to manufacturing cost to give us the total cost of production.

Direct labour cost may be defined as the wages paid for labour expended in the forming or actual shaping of the product, or in its assembly, while the indirect labour cost may be regarded as all expenses in the factory and factory offices for labour that is not expended directly on the goods in process of manufacture, and which cannot definitely be allocated as part of the cost of some particular piece or unit. Primary materials are those that appear in the finished product, either in their original form, or otherwise, including that portion which will be wasted in the process of conversion or shaping to the final form. Secondary materials are those goods which are used up in the manufacture of many articles or products, and the actual quantity of which cannot be conveniently ascertained or charged direct to the article or product. Included under the heading of "Overhead" are all charges and expenses for material, labour, services (such as power, lighting, heating, tools, repairs), and other charges incurred by, or directly chargeable to the factory, such as rents, rates, depreciation, supervision, administration, insurance, other than those already included under the heading of labour and material.

The ascertainment of the cost of production of any unit of output is no simple task. Most businesses have a fairly satisfactory system for ascertaining labour and material costs, but in relatively few concerns can we find a satisfactory allocation of the manufacturing overhead charges, and the more scientific treatment of overhead allocation is one of the contributions of modern costing. Yet it must be remembered that costing is a matter of approximation at the best of times, particularly in connection with the distribution of overhead, so that it is impossible to lay down a hard and fast rule as to which is the better method. The question whether to use the most accurate cost system in whole or part, or some other system which may be less

accurate but requires less clerical work, must be determined for each business separately, with reference to the use that is to be made of the system, the degree of accuracy that the business needs, and the cost of operating the system itself.

Labour Costs.

The cost of labour constitutes a large part of the cost of any commodity. Its calculation involves the greatest amount of detailed work, because it is necessary not only to ascertain the labour cost of every article but to record various kinds of data relative to the efficiency of the workmen. For this reason it is necessary to keep an accurate record of all the time he devotes to the job, the amount he earns, and the quantity of work performed, the precise nature of this record, of course, depending upon the wage system used in the factory. An illustration of the amount of detailed work involved in finding out the labour cost may be taken from the machining of a cylinder block casting of a well-known motor-car, which involves a series of 30 machining operations in a total production time of eight hours.

The essential information in the ascertainment of labour cost is a record, generally on a job card, of the output, time taken, and the wage earned on each operation or job. Experience has shown that the value of the record of time taken is very great. Cost results are better expressed in terms of time and quantity than in money cost. The fluctuating value of money, the alteration of wage rates, and the effect of overtime and special allowances, are factors that make comparisons with other periods and other concerns difficult if such costs are expressed in money. It is easy to appreciate the value of cost records which need not be varied by allowances or deductions for special circumstances, especially when comparisons are required over a long period of time. One large British manufacturing firm, with works in different parts of the country and in many industrial foreign countries, has found this to be the

only way of comparing the efficiencies of its various factories scattered throughout the world.

Obtaining the labour cost is only one of the uses of the job ticket. Examination of the information recorded thereon will bring to light such factors as excessive overtime and night work, abnormal earnings, increases of high-priced labour, and calculations can be made which will reveal the efficiency of individual workers or of groups of workers engaged on related operations. It is possible to set up a standard schedule of indirect workers, and the relation between the cost of indirect services and the cost of directly productive work often affords a useful index of managerial efficiency. As an illustration of the type of control such information affords, we may quote the method followed in a large concern. The majority of the directly productive operations are paid on the piece-work system, with the piece rates fixed by time study. The particular form of wage system employed enables the efficiency of each worker to be measured daily and weekly. After the job cards have been assembled for each worker to enable the pay roll to be made up, they are sorted according to job numbers, and the total time taken and the quantity of output given on each line or operation is arrived at. Thus the efficiency of all the workers on each line is ascertained. This knowledge, when passed to the foreman, affords him a valuable measure of control, and is useful data for the planning department. The manager of the production department is supplied with a weekly wage analysis which shows how the wages are divided between direct, indirect wages, and supervision. The analysis shows the amounts paid under the different methods of payment, and throws into relief the amounts paid for overtime, night work, stoppages due to forces outside the control of the worker, and the hundred and one oddments classified under the heading of "Miscellaneous." With this analysis before him weekly, the manager can study the financial effect of his management of the labour force, take the necessary

steps to rectify wastage, and prevent the leakages which are thus brought to his notice, whether due to the planning organization, the foremen, the various service departments, or the purchasing and store-keeping organization.

Material Costs.

In the majority of concerns, material is the most important item of expenditure. This fact is not always fully appreciated, and insufficient attention is usually given to matters arising out of it. The purchase price of the material embodied in a commodity is comparatively easy to obtain. To this price must be added all the charges in connection with storing and handling the material before its entry into manufacture. Therefore, when the amount required to make a certain number of articles is definitely known, it can be charged at the same rate as that at which it was purchased. An adequate stores system is a prerequisite for the control of material costs. The objects of material records are to find the cost of the material embodied in the finished product, and to locate and prevent leakage or wastage due to defective work, pilferage, or lack of appreciation of the value of by-products.

The control of material costs is furthered by constant supervision of stores through the perpetual inventory system. With this system, cases of slow-moving stocks can be brought forward automatically, the exact record of stock on hand can be known, and the time when replenishment of stock is necessary. Perpetual inventories, however, require perpetual attention, which can be ensured by following some very simple rules. In the first place, no material should be permitted to leave the stock-room without a requisition signed on behalf of the department where it is to be used. In the case of materials made from standard stocks, there is always a tendency to overdraw from stores to cover emergencies, and where many orders are made from similar material the difficulty of discrimination between the amount of each order and class gives an

opportunity for leakages and wastages to pass through without efficient checks. Secondary materials particularly lend themselves to this abuse.

On each requisition should be recorded the kind of material used, the price, the date it was withdrawn from stores, the part into which it was made, and any other information which is necessary to show exactly where and for what the raw material was used. The material cost of each item of production is arrived at simply by sorting and totalling the amounts on the requisition slips.

The factory manager, however, wants to know a good deal more about materials than can be gained from an examination of the material cost of each line as shown by an analysis of the requisitions. For example, in an engineering business the purchasing department may be supplying him with cheaper castings, which are usually bought by weight, but experience may show this saving to be fictitious if a careless or unscrupulous supplier is sending in castings which require additional labour cost in removing superfluous metal in the machinery operations. Another factor bearing upon the cost of production is the amount of money locked up in stock and work in progress. Periodically the manager will want to know the relation between value of stock and consumption, so that he can adjust "stocking levels," for it is the natural tendency of purchasing agents and stores controllers to keep larger stocks than are essential, to cover emergencies. New stock items should only be permitted after the most careful consideration. Leakage in shop supplies can be checked by frequent comparison of actual consumption against standard consumption. The proportion of defective goods thrown out on inspection will need to be examined systematically to see whether the spoilage is excessive and why it is defective at all. The effect of these and kindred items upon total cost of production will be fully appreciated, and the records, in addition to providing the material cost for each product, should enable such reports to be obtained accurately and promptly.

Overhead Charges.

The portion of the total cost of production paid for raw material, and for the labour directly engaged in the production of the goods is easily ascertained, but that called overhead, oncost, or burden (which is often greater than the sum of the cost of direct labour and material) can only be approximated. Some overhead expenses are merely estimates, based upon judgment and experience, and the amount of overhead charged into the cost of any product will depend upon the accounting system that is used, and on the ideas of the accountant or management as to the method of allocating the overhead.

For example, capital in the form of buildings and machines is used up in production, and the sum charged annually in the financial accounts for this use is called depreciation. The difficulty of assessing the precise amount to be charged must be obvious. The probable working life of the wasting asset is the determining factor, but this depends upon the amount of wear and tear to which the asset will be subjected, and also the possibility of obsolescence through new inventions. The usual method of charging depreciation is to charge a fixed sum annually over a period of years, so that the original capital value of the buildings and plant will be recovered before the asset has been worn out. At the same time, there is much to be said for the practice followed by many businesses of writing off larger amounts in times of prosperity, when increased trade involves greater wear and tear, and a smaller amount in times of sub-normal productivity. The normal rate of depreciation cannot be considered apart from the policy of the business in relation to repairs, renewals, and maintenance.

The nature of the business also is important, for the risk of obsolescence is much greater in connection with special purpose machines than in the case where standard type machines are used. In any particular business it is desirable to classify the various types of machines and

plant, and to fix depreciation rates for each kind of equipment. Whatever the method of calculation of depreciation employed, the vital thing is to measure the amount of "expired capital outlay," caused by the production of the period.

When an attempt is made to allocate the depreciation charges to any particular product, the elusive nature of overhead charges is realized. The expense of wear and tear is dependent upon the volume of production, but, in the matter of obsolescence, time is largely the governing factor. The difficulty of making a correct apportionment of the depreciation charge to any product illustrates the general difficulty of the apportionment of overhead charges, and indicates the desirability of making a fairly detailed study of this branch of the subject of costing.

Overhead has already been defined as the total expenses incurred in the manufacture of an article apart from the labour and material cost. It includes all the expenses which cannot be directly charged to a product or process, but can only be allocated to some chosen method. The overhead charges of a factory can be divided into two classes, viz., fixed charges and variable charges. Fixed charges are those which are independent of the volume of production, such as rates, insurance, depreciation due to obsolescence, salaries of managers, head foremen, shop clerks, and certain elements of indirect labour, such as watchmen, storekeepers, cleaners, inspectors, etc. Variable charges are those which are dependent more or less on the volume of business, such as depreciation, repairs and maintenance due to wear and tear, power, heating, lighting, certain indirect labour, small tools, supplies such as oil, waste, etc. As the amount of most of the expenses is not known until some time after the services have been rendered, it is necessary to use either the total expenses, as shown in the trading and profit and loss accounts of the previous year, or an estimate of what these expenses are likely to be for the current year, bearing in mind the volume

of business to be done during that year. After we have determined the character and amount of the expenses that shall be included in the overheads, the next step is to ascertain to what extent the apportionment of the individual items of expense to the various departments can be based on ascertainable facts. Cost accounts are only possible as a superstructure erected on a foundation of administrative records, and reference should be made to such records for information as to the capital value of plant and buildings, the cubic space and floor space, the amount paid in wages, the number of man-hours, the number of machine hours worked, the amount of power consumed, etc., for each department and process. Where such records exist, it is a relatively easy matter to distribute each separate expense item to the departments or productive centres in a manner which makes due allowance for its special character and its relation to the various products to which it must ultimately be charged. For example, repairs will be "spread" on actual amounts of expense incurred, rates and insurance will be apportioned according to the capital value of plant and machinery, general heating according to cubic capacity, lighting according to floor space, health and unemployment insurance on the actual amounts paid, workmen's compensation insurance on wages paid. In most cases, however, such accuracy cannot be achieved, and cruder methods have to be applied. Examine, for example, the difficulties of a factory using steam for general heating and process work, and for cleaning purposes. To measure the amounts of steam, electricity, and water used by means of meters may be very costly and even impossible, especially when steam and electricity mains have had to be tapped at various places according to the changing needs of the factory. In such a case, the only possible method of distributing these expenses is to rely on the judgment of the engineer, who can make an allocation to the departments on the basis of tests, and from his knowledge of the power consumed by the various plant

units. Whatever the method of allocation used, the essential point is to distribute each separate item of expense to the department and process, or operation, on as rational a basis as can be found, maintaining that degree of accuracy in apportionment which is reasonable and serviceable for the business.

When the overhead expenses are distributed over the various departments, processes and productive centres in the factory, the question next arises as to the basis on which these departmental or process charges shall be applied to the individual products. The simplest method is to charge the overhead as a flat rate per unit of product. It is only possible to apply this method satisfactorily in the case of factories producing one kind of product, or factories where each line of product passes through the same manufacturing processes in approximately the same time. Another method adopted widely in British concerns is to apportion the overhead charges to the individual products as a percentage on the direct labour cost. The popularity of this method is no doubt due to its extreme simplicity. It leads to accurate results only in those cases where the various products are fairly uniform in size and kind, pass through the same processes in manufacture, and where there is uniformity of wage rates and machine equipment. In most factories these conditions do not apply, for earnings differ according to the age and ability of the workers, and the size, the cost, and the nature of the machines in each department and process vary considerably. The amount of building expense to be charged to a product is determined by the amount of floor space which a machine or work bench occupies, and the expenses of rent, heating, lighting, repairs, and depreciation of buildings, etc., cannot be accurately measured by the wages of the worker operating that machine or hand process. Moreover, the rent, power, repairs, depreciation, and miscellaneous supplies necessary to the running of the machine are all expenses which are determined by the size and nature of the machine,

and not by the rate of pay of the machine operator. Where the work is paid for on a piece-work basis, the costs obtained by this method never decrease, however much the time taken to do the job may be reduced. This method can only be safely applied, therefore, where all the work is done under similar conditions and where the workers receive the same rate of pay.

A variation of this method, which has all its disadvantages and may be even more misleading, is to apply the overhead as a percentage of the wages and material cost. It is too difficult to see how the price of the material used influences the overhead charges, e.g. in the making of card boxes it may be found that the cost of the cardboard, paper, trimmings, labels, etc., for one type of box may be twice the cost of a similar box of inferior quality, yet it may be made at the same rate, and should have the same amount of overhead added. If, however, it takes longer to make the higher grade box because of the nature of the more expensive materials, then, generally speaking, the wages also would be higher, and it would be more accurate to distribute the manufacturing overheads as a percentage of wages than as a percentage of wages and material. The remaining methods of distributing the overhead charges, viz., man-hour rate and machine-hour rate, are based upon the fact that most of the expenses included in overhead depend upon the passage of time. All the fixed expenses, such as rent, rates, insurance, depreciation, management salaries, etc., are directly proportional to time, and a large proportion of such items as repairs, heating, lighting, indirect labour, etc., are dependent upon time more than any other single factor. Where hand labour predominates in any process of manufacture, the overhead charges are recovered by charging a rate per direct man hour. This rate is arrived at by relating the estimated expenses for the year to a close estimate of the total direct hours which are likely to be worked during the year. The figures of previous years are carefully examined

and modified in light of the production programme laid down for the year, so that as accurate a rate as possible is reached. The man-hour method of distributing overheads has the advantage over the percentage on wages method, in that it takes account of the different speed at which work is done, due to differing ages and ability of the workers. The amount of overhead charged to each job under this method of distribution will, therefore, be more in proportion to the extent to which the various services of the department have been used.

Where the process is essentially a machine operation, the overhead charges are recovered by charging to each job a rate per machine hour for the time the job takes to pass through the machine. In this method each machine or group of similar machines is assigned a certain hourly rate, the amount of which depends upon the estimated cost of keeping it in the factory, and supplying it with power, heating, lighting, and supervision. The cost includes interest on its capital cost, a charge for the estimated annual repairs, probable depreciation through wear and tear and obsolescence, charges for the space occupied (e.g. rent, rates, lighting, etc.), for power, for supervision, and for indirect labour, such as tool makers, crane men, inspection, labourers, etc. These charges are calculated for the year, and the total for each machine is divided by the number of hours which the machine may reasonably be expected to run in the year, judged by the record of previous years.

Although time is the main factor in most items of overhead expenses, and although a judicious blend of the "man-hour" and "machine-hour" method of allocating manufacturing overhead charges is probably the most accurate method at our disposal, there is no one method that can be regarded as absolutely accurate and suitable for all conditions. The nature of the products, the methods under which they are made, the size of the factory, and the volume of production, are all factors which must be taken into account in deciding which method should be used.

Even in those factories where the scientific allocation of overhead has received most careful consideration, there will be found necessary variations in the system of allocation within the factory. The general consideration to be kept in mind in selecting the method to be used, is the approximate relationship of overhead expense to total cost of production. In cases where the overhead expense is a comparatively small factor, errors of allocation arising from the method used would be relatively unimportant. Where overhead is the largest class of expense in the total cost, however, it is advisable to adopt a method of distribution which gives the closest approximation to the actual conditions. In businesses where the classes of products are few and where each class of product goes through materially the same operations, the percentage on labour method or the man-hour method will generally give satisfactory results.

Standard Costs.

All the methods of distributing the overhead charges described above assume that it is possible to make close estimates at least a year earlier of the amount of the expense items and the volume of production, whether expressed in direct wages, man-hours, or machine-hours, for each department or section of the factory. This naturally brings up the question of what is to be done when the actual expenditure or production varies widely from the estimate. A trade dispute, a change in governmental financial policy, a tariff change, or other legislation, foreign competition, the failure of harvests, etc., may at any time upset careful calculations, and give rise to a discrepancy between the overhead charges actually incurred in a period and those recovered, by charging to production the predetermined overhead rates. Some have advocated that the balance of undistributed or unearned overhead should be spread over all the work done as a supplementary rate. This suggestion is based on the principle that the cost of the product in a

given period should include all the overhead expenses of that period, whether or not a large part of the machinery is idle.

Throughout our discussion of costing, we have been looking at the question from the factory manager's point of view, and when we consider the uses that the manufacturer may make of costs, we realize that costs prepared on the lines of the theory that current production, however small, must bear current expenses, however large, will only lead to confusion and unsound business policies. The manager wants to know from his cost figures—

1. Whether production efficiency is being maintained, increased, or decreased.
2. The extent and location of unnecessary expenditure or waste.
3. The spots in existing shop practice where economies can be effected.
4. How the actual costs compare with an ideal or standard cost.
5. His costs of production as a reliable basis of price fixing.

When a varying output which is entirely outside his control is allowed to affect the cost of the work done, the value to the manager of the cost record as a measure of efficiency is destroyed, and comparison with previous performance is futile. Such figures fail to provide an accurate guide to future policy, and the time and trouble spent in their compilation is largely wasted.

The true import of idle plant and unabsorbed expense is now being recognized. Reliable costs, comparable under all conditions, cannot be secured unless the overhead charged to production relates only to the equipment that is actually used. Hence, we may note an increasing tendency towards the establishment of standard or normal costs on the basis of a standard output. The establishment of a standard cost entails the ascertainment of standard overhead expenses for a period sufficiently long to include the

normal fluctuations of a manufacturing business. This standard overhead, once ascertained, is distributed over the output in strict proportion to the amount of direct labour for any period, or for the number of man or machine hours, as the case might be. In this way, costs will not be affected by trade fluctuations due to circumstances beyond the control of the manager. The factory expense will be allocated to the factory production for any period in the proportion which the output for that period bears to the standard output, whether the output be measured by the amount of direct labour, or in man or machine hours. Costs ascertained in this manner will, therefore, be normal costs, from which the effect of fluctuations due to outside conditions are eliminated. Undistributed or excess overhead will be debited or credited to the profit and loss account, and when so presented will direct definite attention to facts which if submerged in the general mass of costs would often escape unnoticed.

A costing system which efficiently accounts for overhead in this light constitutes one of the best means at a manager's disposal for keeping in close touch with the efficiency of the factory. It will indicate the direction of more economical production, by focusing attention clearly on the many elements tending towards waste in human effort and materials, and extravagance in overhead expenses, and by supplying information relating to idle plant and equipment will help the management to decide whether the shortage of work is due to selling policy or organization, or to other circumstances beyond their control.

Administrative Expenses.

Administrative expenses include those items of expense which are incurred in the financial and general administration of a business. The expenses generally included under this heading are such items as the salaries of directors, general manager, secretary, accountant and cost accountant, the costs of their respective departments, legal expenses,

interest on debentures (if any), and bank overdraft, audit fees, and such proportion of the salaries and expenses of the general office staff as cannot be charged out either to production or to selling expenses. Practically all of these expenses are fixed, and therefore independent of the output of the factory. Some of them can be charged out to either production or to selling, but the general practice is to make an arbitrary division of the administrative expenses over the factory and selling sections, and to allocate the amount distributed to the factory on the same basis of factory overhead.

Selling Expenses.

Selling expenses comprise the whole of the items of expense which are incurred in the sale and distribution of the goods, and generally the cost of advertising is also included. The expenses usually included under this heading are such items as the salaries of the sales manager and his staff, the expenses of depots and branch sales offices, allowance for bad debts, agents' commissions, travellers' salaries and commissions, stationery and postage, the cost of advertising, and that proportion of the administrative expenses allocated to selling expenses. Sometimes the cost of packing cases and other containers, together with the expense of the dispatch department, and the cost of carriage outwards, is included in selling expenses, but the practice varies with the nature of the product and the custom of the trade. The allocation of selling expenses over the products has received scant attention in this country, and most firms are content to adopt the rough and ready method of charging out the expense as a flat rate per order, or as a percentage on production cost or on net selling price. The method to be adopted depends upon the nature of the business, but the increasing proportion of selling and distribution charges will force attention upon this branch of costing, and lead ultimately to the devising of more detailed and accurate methods.

Conclusion—The Value of a Costing System.

We have dealt in some detail with costing finding as a branch of administration in the belief that the concern which is most closely in touch with its own current facts and happenings is in the best position to face the uncertainties of commercial competition. But costing finding is only a preliminary step to cost reduction, and we have yet to find the cost system which automatically reduces cost without management action. A record of itself does no good unless the action which it shows should be taken is taken. This means that costing and other records must be up to date, and rendered on time to all the parties they should reach. Cost and other statistics must be news, not ancient history; they must present vital, dynamic information, so that effective action can be taken. The value of the best costing system yet devised depends in the last resort upon the use made by the management of the facts it reveals. The test as to whether it is worth while is that its expense is much less than its direct or indirect effect on the making or safeguarding of profits. The costing department must be a revenue-producing rather than an expense department. It must provide the administrator with information which will guide him in the elimination of those things which reduce his profits. It should tell him not only what his costs have been, but also what they should have been, and where the excess cost lies.

It is evident that costs should be accurate, and the cost system not too elaborate to be workable. What is not so evident is that cost figures should possess the degree of accuracy most advantageous to the particular business. Common sense must in every case define what is reasonable and serviceable accuracy. Although the system should be simple, it must reflect the actual occurrences in the factory without loss of accuracy. In a complex business, it is frequently misleading to attempt to compress results into too simple a form.

BIBLIOGRAPHY

Books marked with an asterisk () are published in England*

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- Shop Management.* F. W. Taylor. (Harper Bros., 1919. 7s. 6d.)
The Principles of Scientific Management. F. W. Taylor. (1914. 10s. 6d.)
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Scientific Management. C. B. Thompson. (Harvard University Press. 17s.)
Scientific Management and Labour. R. F. Hoxie. (D. Appleton & Co., 1915.)
Twelve Principles of Efficiency. H. Emerson. (Engineering Magazine Co.)
Scientific Management Since Taylor. E. E. Hunt. (McGraw Hill Book Co.)

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* *The Philosophy of Management.* O. Sheldon. (Pitman. 10s. 6d.)
* *The Works Manager of To-day.* S. Webb. (Longmans Green & Co.)
Industrial Administration. L. C. Marshall. (University of Chicago Press. 22s.)
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Management's Handbook. L. P. Alford. (Ronald Press. \$7.50.)
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The New Leadership in Industry. S. A. Lewisohn. (Pitman, 1926. 7s. 6d.)
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Industrial Management. R. H. Lansburgh. (Wiley & Sons, 1923. \$5.00.)

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Personnel Management. W. Scott and R. C. Clothier. (A. W. Shaw Co. 18s. 6d.)
* *The Human Factor in Business.* B. S. Rowntree. (Longmans, 1925. 2s. 6d.)

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* *The Administration of Industrial Enterprises.* E. D. Jones. (Longmans. 18s.)

Maximum Production. C. E. Knoeppel. (Engineering Magazine Co.)

The Foreman and his Job. H. Diemer. (La Salle University, 1925.)

(E) ADVERTISING.

The Psychology of Advertising. W. D. Scott. (Small, Maynard & Co., Boston.)

* *Advertising Campaigns.* Tipper & French. (Library Press, Ltd.)

* *Modern Advertising.* (Pitman. 63s.)

(F) SELLING.

The Selling Process. N. A. Hawkins. (Detroit, 1923. \$3.50.)

Problems in Sales Management. R. H. Tosdall. (A. W. Shaw Co., New York, 1925. 25s.)

* *Sales Management.* C. L. Bolling. (Pitman. 10s. 6d.)

The Selection and Training of Salesmen. H. G. Kenagy and C. S. Yoakum. (McGraw Hill Book Co., 1925. 20s.)

Creative Salesmanship. H. H. Hess. (J. B. Lippincott & Co., Philadelphia, 1923. 15s.)

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Shop and Office Forms. W. Clark. (McGraw Hill Book Co., 1925. \$2.50.)

Office Management: Its Principles and Practice. L. Galloway. (Ronald Press Co. 25s.)

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Office Appliances. W. H. Leffingwell. (Office Equipment Catalogue Inc., Chicago. \$5.00.)

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Cost Accountancy. J. L. Nicholson and J. E. D. Rohrbach. (Ronald Press, 1922. 25s.)

* *Factory Administration and Accounts.* E. T. Elbourne. (Library Press, Ltd., London, 1918. 32s. 6d.)

* *Business Research and Statistics.* J. G. Frederick. (Library Press, Ltd., London, 1920. 15s.)

Business Statistics. M. T. Copeland. (Cambridge Press, Mass., 1917. \$4.00.)

* *Cost Accounts in Principle and Practice.* A. C. Ridgway. (Pitman. 5s.)

Manufacturing Costs and Accounts. A. H. Church. (McGraw Hill Co., New York.)

* *Factory Accounts.* Garcke and Fells. (Crosby Lockwood & Sons.)

Proper Distribution of Expense Burden. A. H. Church. (Engineering Magazine Co.)

* *Cost Accountancy: an Explanation of Principles and a Guide to Practice.* L. Whittam Hawkins. (Gee & Co., London.)

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Readings and Problems in Statistical Methods. H. Secrist. (Macmillan, New York.)

Statistics in Business. H. Secrist. (McGraw Hill Co., New York.)

Introduction to Statistical Methods. H. Secrist. (Macmillan, New York.)

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Marketing Methods and Policies. P. D. Converse. (Prentice Hall, New York, 1926. 12s. 6d.)

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Principles of Marketing. P. W. Ivey. (Ronald Press Co., New York. (\$3.00.)

Marketing: Its Problems and Methods. C. S. Duncan. (Appleton Co., New York, 1920. 16s.)

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Elements of Retailing. R. Leigh. (D. Appleton & Co., New York. 8s. 6d.)

Selling Expenses and their Control: A Study of the Retail Trade. Prentice Hall, New York, 1922. (\$4.25.)

* *Successful Retailing.* Eric N. Simons. (Pitman.)

Chain Stories. (Hayward and White.)

Modern Retail Methods: Records and Accounting. Lynn M. Comstock. (United States Corporation Company. \$10.)

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Waste in Industry. Committee of the Federated American Engineering Societies. (McGraw Hill Book Co. 20s.)

Wealth From Waste. A. J. Spooner. (Routledge, 1919. 7s. 6d.)

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Business: A Profession. L. D. Brandeis. (Small Maynard & Co. 14s.)

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Efficiency Ideals. Thistleton Mark. (Warner Laurie. 3s. 6d.)

Industrial Leadership. H. L. Gantt. (Yale Univ. Press. 5s.)

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* *Industrial Combination in England.* P. Fitzgerald. (Pitman. 7s. 6d.)

* *Methods of Amalgamation.* A. E. Cutforth. (G. Bell & Sons, Ltd., 1926.)

Modern Industrial Consolidation. J. G. Frederick. (Frank Maurice In, New York, 1926. \$5.)

Factors in Industrial and Commercial Efficiency. Committee on Industry and Trade, 1927—Report, Part III. (H.M. Stationery Office. 5s.)

Monopoly and Composition. Herman Levy. (New Edition, 1927.)

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Simplified Practices. C. Chisholm. (Chapman Hall.)

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