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Personnel
and
Labor Relations

Personnel
and
Labor Relations

by

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It is, in part, as a reflection of this growing group consciousness, with a further conviction that much of that feeling will long persist, that major emphasis in this presentation falls upon group problems. Collective bargaining with independent unions is taken for granted as a relatively permanent feature of many employer-employee relationships, and it is assumed that, even where formal union organizations are not involved, management will quite generally accede to labor's expressed preference for group rather than individual consideration.

Analysis of group problems is facilitated by various statistical tools, many of which are widely encountered in the literature of personnel administration. Several of the most useful of such tools are described throughout the various chapters that follow, and illustrative problems, reduced in extent so that they may be regularly assigned, are included for those who care to use such material.

Within the chapters, sections devoted to such statistical analysis have been clearly labeled, and they may be omitted without injury to the descriptive sections to which they are related. Many instructors may wish to ignore them and the problems entirely, especially if the entire breadth of the field is studied in a single quarter or semester. On the other hand, some of these devices may properly be regarded as almost essential to intelligent administration of present-day industrial relations. They represent a means, and almost the only means, by which management can maintain a constant check on the efficacy of many managerial policies affecting personnel. They make it possible for management to identify its course and discover where it appears to be going in industrial relations. Viewed from another angle, they parallel the measures of financial progress regularly made available by the auditing division or the analysis of production schedules provided by production departments. Only a beginning has been made in the regular application of these analytical tools to the problems of industrial relations, but they have so thoroughly demonstrated their use-

fulness that slight question can be raised as to their wider use in the future.

Each of the chapters is accompanied by a list of selected collateral readings, and footnotes throughout suggest specific studies and investigations for further consideration. The author, in his own classes, has followed the practice of asking each class member to present a brief written summary or abstract of one such reference for each chapter, and that practice is suggested in the exercises accompanying each chapter.

A word of caution is appropriate, especially for those adult representatives of management who may be so concerned with problems of industrial relations as to attempt to follow suggestions stated or implied in this presentation. It must be clearly understood that successful managerial direction of industrial relations is not an achievement to be gained in a day, after management has experienced a sudden conversion to sound personnel policies. On the contrary, it is a development that necessitates painstaking consideration over a period of years. Depending primarily, as it does, upon general recognition of the soundness of managerial policies by workmen who are largely uninformed as to management's problems, successful administration of industrial relations requires an extensive period of honest, effective interpretation as well as the actual adoption of appropriate personnel practices. Management must first of all conceive and adopt a sound labor policy; then it must convince employees of the soundness of that policy.

The first step necessitates an open mind and a critical evaluation of every phase of industrial relations, an appraisal in terms of values clearly enunciated in a statement of fundamental principles. Then, as the process of appraisal continues, employees must be encouraged to accept the facts of management's sincerity and of the fairness with which every phase of personnel policy is established and maintained, or, if found wanting, is discontinued.

Development and maintenance of fundamentally sound

industrial relations is thus a long-time, permanent program, rather than a sudden achievement. Essentially, it depends upon continuous analysis and appraisal, adjustment and re-adjustment of personnel policies, coupled with constant, effective interpretation of these policies to the entire working force.

Numerous debts to colleagues, students, assistants, and others might be acknowledged here, but they are, as far as possible, indicated where reference is made to the contribution involved.

DALE YODER

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Personnel
and
Labor Relations

CHAPTER I

Introduction

PERSONNEL administration is the business or administrative aspect of industrial relations. Its principles represent the answers that business and industrial administration gives to the numerous and complicated questions arising out of modern industrial relations. Study of the administrative phases of industrial relations may well begin, therefore, by answering the primary questions that naturally arise when personnel administration is mentioned. Prominent among such questions are those that ask what personnel management is, why and how it has developed, and how it may best be studied and understood.

This chapter and several of the chapters following are intended to answer these questions. In the present chapter, the meaning and content of the field of personnel administration are described. Chapter II presents a brief historical summary of the factors that led to the emergence of personnel management and to its present significance in modern business and industry. Chapter III is devoted to a description of the approaches that have been most commonly utilized in studying and developing the present body of principles and practices. Chapter IV explains the simpler and most frequently used statistical tools requisite for the study of personnel management.

The field of management as it applies to industrial relations may be defined in several ways. It may be described in general terms, or it may be considered in more detail in terms of its purposes, its method, its assumptions, its interest to various parties in the productive processes, and its major divisions and functions. These various as-

pects of modern personnel control are given fairly extended treatment in subsequent paragraphs of this chapter.

General definition. In general, it may be said that personnel management is simply one phase or aspect of the general field of management. In that sense, it plays an important part in all types of modern business management, in retail as well as wholesale merchandising, in manufacturing and transportation, in banking and education, in short, in every situation where certain individuals entrusted with the duties of management seek to secure and maintain the efficient coöperation of other persons who perform the functions of the enterprise. Personnel management is that phase of management which deals with the efficient control of man power, as distinguished from those phases which are concerned with all other sources of power.

Lest it be concluded from this definition that personnel administration is regarded as a distinct and separate division, set apart from all others in the realm of management, it may be said that any realistic approach to the field must recognize that, in most situations, any such separation is practically impossible. Actually, all managers are personnel managers, whether or not they recognize that fact or desire to be so regarded, for everyone who is called upon to assume managerial responsibility, in however slight a degree, must at the same time assume responsibility for the personnel problems and policies involved. In most cases, particularly in small business concerns, the same individual must of necessity be charged with the duty of determining business policies at the same time that he controls policies directly involving the men who work under his direction. Personnel management is thus of interest not only to those who head personnel departments or hope to achieve that goal, but also to all those who have or expect to have any sort of managerial responsibility in modern business and industry, as well as in educational or other administrative positions.

Purposes of personnel administration. The purposes of personnel administration might reasonably be inferred from

its relationship to the general field of management, for they arise out of the obvious purposes of modern business administration. The basic purpose of personnel administration is that of securing maximum productive efficiency from the man power involved, and all of its principles and practices are based upon that fundamental purpose.

Such a simple statement of purpose may, however, prove misleading if it leads to the conclusion that the devices of personnel administration are similarly uncomplicated. For that reason, it may be worth while to expand this description of the major purposes of modern management to some extent, in order that the full implications of the statement may be recognized. The fact is that the purposes of modern industry are not simple but complex. From the standpoint of society, the purpose of industry is to provide goods and services when and where they can be enjoyed by the members of society. As that purpose is generally stated in economic literature, it is the satisfaction of human wants. On the other hand, from the standpoint of the individuals involved in the process, the purposes of economic activity are somewhat different. From the individual viewpoint, the purpose of such endeavor is not the satisfaction of social wants but the provision of wages, interest, rent, or profits—depending upon the part played by the individual in the process—with which individual wants may be satisfied. Because modern society in the western world is organized primarily upon the basis of individual freedom, the second of these objectives tends to predominate in determining the nature of modern industrial administration, and, what is more important, the purposes of such management. But both phases of the purpose of industry, the social as well as the individual, must be borne in mind in considering the purposes of modern personnel administration.

To make the achievement of these purposes possible in the greatest degree, modern industry has made extensive use of the division of labor and of specialization. It specializes ownership, management, and actual performance of individ-

ual productive tasks, so that management is charged with the responsibility of coördination, direction, and control. In filling this responsibility, management seeks to secure the efficient coöperation of all contributors to the productive process. It must make use of and combine all types of factors—land, labor, and capital—in the most efficient manner possible. It utilizes all sorts of power—steam, electric, water, and man power.

Personnel management is the term applied to the management of man power in this situation and under these circumstances. It is concerned with the methods and techniques by means of which the purposes of industry may be most effectively served through the efficient control of man power. It is made up of the body of principles and methods by means of which this result may best be obtained, principles and methods based upon an understanding of the peculiar nature of man power and its relation to efficient performance. For, just as the efficient utilization of electric power rests upon an understanding of the nature of electricity, so does an efficient utilization of man power rest upon an understanding of the nature of human workers. Moreover, it is also true that the most efficient utilization of labor power frequently depends upon the personal development of the workers, as well as upon an understanding of the nature of labor in general, so that most modern personnel programs include measures designed to effect the greatest possible development of workers' personalities.

From this statement it will appear clearly that modern personnel management is not paternalistic in nature, for its purpose is the same as that which motivates management to secure bids from prospective sellers of raw materials or contemplate a revision of plant layout or the routing of materials. It is not welfare work, not middle-class humanitarianism, not emotional effusions directed at "poor unfortunates." Rather, it is a matter of sound business policy, designed to make workers as efficient as possible in the tasks for which they are best fitted, and to secure maximum, long-

time productivity from every person involved in the productive process.

Method of personnel administration. The method of personnel administration arises directly out of its fundamental nature, as the latter has been described in preceding paragraphs. From what has already been said, it will be recognized that personnel administration is really an applied science or art, similar in nature to engineering, education, or medicine. Its method is similar to that of all other applied sciences in that it makes use of the discoveries of the pure sciences in solving the problems with which it is faced.

Such an applied science may make use of knowledge gained from a host of pure sciences. As a matter of fact, personnel administration does utilize the discoveries and contributions of numerous sciences, and it leans heavily upon economics, psychology, physiology, and sociology, although there are numerous problems confronting those in charge of personnel in which sciences other than these may be called upon to assist in the formulation of satisfactory solutions.

The nature of this dependence of the applied science of personnel administration upon underlying pure sciences may be illustrated by reference to some of the problems that require consideration in scientific terms. Problems arising out of the establishment of group insurance programs or pension plans, for instance, require for their intelligent solution an understanding of the economic principles affecting wage payment, as do also such personnel problems as those involved in the provision of minimum wages, wage adjustment to changing technology in production or to changing price levels, and numerous other similar problems.

Those charged with the administration of personnel must depend, in a similar manner, upon psychology for assistance in the solution of many of their problems. How may suitable candidates, for instance, be easily recognized and selected for particular positions? A portion of the answer to this question is to be found in the use of de-

vices that have been developed and are being constantly improved by psychologists, including various types of tests. Similarly, in providing vocational guidance for workers after they have secured employment, in determining the types of positions towards which each employee should aim, in discovering means for maintaining interest in daily work and for preventing fatigue and unrest, as well as in devising satisfactory approaches to problems of tardiness, absence, and shop rule violations, personnel administrators must rely upon those who have analyzed and are continuing to study basic psychological processes.

In recent years the relationships between numerous personnel problems and underlying physiological conditions have come to receive increasing attention, and it is apparent that management must give more attention to the satisfaction of fundamental physiological needs of workers if the latter are to perform with maximum efficiency. Physiological research has shown significant relationships between temperature, humidity, and lighting (to mention only a few of the most obvious of such conditions) and the performance of workers, and other studies have demonstrated the influence of various types of working conditions on industrial health. Since the problem of employee health is of greatest importance in efficient performance, personnel administrators cannot ignore the contributions of modern physiology in its solution.

The applied science of personnel administration thus makes use of the contributions of every science that can assist in the solution of the labor problems with which management is faced. The sciences mentioned in the preceding paragraphs are but a few, although probably the most important, of the many whose discoveries contribute to the solution of personnel problems. Sociology is another, for its analysis of the factors involved in morale, its study of the influence of cultural elements upon the behavior of the worker, its investigations of community life, of the family, the home, and related institutions, its excursions into the

nature of unrest and the means of communicating unrest—all have a direct bearing upon highly important personnel problems. Even the physical sciences, to a lesser extent, have important implications for personnel, although greatest dependence must naturally be placed upon those sciences that study the human being and his behavior. From all these sciences, personnel administration seeks pertinent suggestions as to means by which human performance of the work of industry and business may be made more efficient and more satisfactory to those who are involved in that work.

Basic assumptions of personnel administration. Certain elementary and fundamental assumptions determine the nature of modern personnel administration, and their recognition may assist in providing a clear-cut definition of the field. In the first place, modern practice assumes the absolute necessity of capitalistic industry (although not, of course, private capitalism) in present-day society. Its definitive characteristics, the specialization of function and the use of saved, accumulated capital in productive processes, are assumed to be essential to modern life. Large-scale production, transportation, and distribution are possible only where accumulated capital is available; they could not perform their usual functions without the masses of capital, in the form of factories, railroads, steamships, and wholesale and retail stores, that are a feature of all modern societies. Moreover, it is assumed that this mass production is absolutely necessary in populations as dense as those of all modern nations. The numbers of people that now inhabit the United States, for example, could not possibly be supported on existing scales of living by its natural resources without the efficiency and economy of large-scale production.

It is, moreover, precisely in large-scale, capitalistic production and distribution that the need for personnel administration arises. The vast majority of modern personnel problems would not appear in a society in which the capital-worker ratio was low, in which large numbers of workers

were not brought together in mills and factories, in which most individuals were self-employed, and in which all productive establishments were small shops, where close personal relationships might be established between employer and employee. It is the impossibility of meeting the needs of modern societies with such a productive system that is, in large measure, responsible for the problems with which personnel administration deals.

It must be clearly understood, however, that the necessity for capitalistic industry does not at the same time require the private ownership of capital goods. On the contrary, numerous essential activities in modern societies operate with capital that is socially owned and managed. The postal system in the United States is precisely of this type, and there are numerous other less imposing illustrations. Moreover, it is entirely possible that the future may see an increase in the number and extent of productive processes that are undertaken on a basis of social rather than private capitalism, and it is conceivable that nations may generally discard private capitalism in favor of some socialistic or communistic system.

From the point of view of personnel administration, it makes little difference who owns the capital. The essential assumption is that some sort of large-scale, capitalistic enterprise is essential and that, under capitalism, personnel problems will be much the same, however the capital is owned. The personnel problems of the post office, for instance, are not essentially different from those of a large steel company, creamery, or railroad. In each case, since the size of the venture is so great that personal relationships between management and workers are distant and tenuous, some formal means of bridging that chasm is required for an effective *rapprochement*. The provision of that means is the particular province of personnel administration.

There is, therefore, nothing reactionary in the assumption that capitalism is necessary in modern society. Rather, the assumption is distinctly realistic, for it recognizes the prob-

ability of continued evolution in capitalistic production as well as the significant part that such enterprise plays.

A realistic approach must, of course, recognize the pre-dominance of private capitalism in modern American society, and it must at the same time appreciate the fact that certain types of personnel problems grow directly out of that private ownership. In private capitalistic industry employers are in reality stockholders, who may or may not be at all familiar with or interested in the problems of their employees. They are unlikely to have any knowledge of working conditions in their properties. The motives that have encouraged stock ownership are those of private profit, and the major objectives, as far as stockholders are concerned, are regular and appreciable earnings and appreciation in the values of the stocks involved. It is inevitable, therefore, that there should be a gigantic and unbridged social distance between owner and employee in large-scale corporate industry, and certain of the most important personnel problems arise out of that particular situation.

Another important assumption concerns the harmony or lack of it in the interests of these two parties in the production process. Are the interests of employers and employees directly opposed, as is usually charged by leaders of radical social and political movements? Or, are these interests completely harmonious, as has been implied in some of the more paternalistic managerial programs? The answer would appear to lie between these two extremes. Some of the interests involved seem to be directly opposed. It is to the interest of workers, for instance, to secure maximum wages or earnings, and it may appear to make little difference to them whether or not the services rendered are worth the compensation paid for them. On the other hand, it is the employer's objective to reduce all costs to a minimum, and he cannot but recognize the fact that in many industries the greatest costs are those of labor. Naturally, therefore, he seeks to reduce unit labor costs, and it may frequently appear that the most direct means of doing so is to reduce

hourly or weekly earnings. In both cases, however, there is a question as to whether the apparent conflict of interests is as real as it seems. Thus, the worker does not actually gain if the wage he enforces results in an extensive reduction in the demand for his services, and the employer frequently discovers that higher weekly or hourly wages may be accompanied by more efficient production and lower unit labor costs. Moreover, there are numerous interests in which the harmony is apparent. Both parties benefit from steady production and employment. Both gain from successful efforts to reduce costs, to secure the market, and to guard and protect it from encroachment by competitors within the same field, as well as from the competition of other goods and services that might be substituted for it. Whether employers are individual entrepreneurs or governments, this condition prevails, although not to the same extent, for governmental agencies or regulated public utilities may enjoy more effective monopolies than those of private business. To a considerable extent, therefore, both employers and employees gain from efficient production methods. It can be fairly said that many of the most important and direct interests of workers and managements are quite harmonious, and, equally important, that only by subordinating such interests as are opposed can the mutual interests be most effectively advanced.

The true situation with respect to interests of employer and employees has been aptly described¹ as a partnership, in which individual interests are, in a considerable measure, subordinated to common objectives.

Public interest in industrial relations. It is apparent from preceding paragraphs that both employers' and employees' interests are advanced by efficient personnel administration. To management, it means lower unit labor costs, more efficient use of capital, and an improved competitive position, all based upon a more enthusiastic and

¹ Bowers, Glenn A., "Labor Problems Under Government Regulation," *American Federationist*, September, 1937, Vol. 44, No. 9, pp. 927-932.

effective coöperation of workers and upon reduced strife and industrial unrest. To such employees as can meet the requirements set up by careful selective programs and will play their part in the coöperative venture, it means increased personal efficiency, higher earnings, steadier employment, more satisfactory adjustment to the work to be done, and advanced living standards.

Successful personnel administration has advantages, however, not only for management and employees, but for the public as well. Increasing efficiency in production means higher living standards for consumers as well as producers. Friction and strife so prevalent now can be and are being replaced by sound personnel relations making for effective coöperation between management and employees. Exploitation of workers, in the long run, is definitely reduced by a program that tends to use their services most effectively and, at the same time, with maximum concern for their long-time value to society.

Personnel functions. It has been indicated that personnel management represents one phase or aspect of management as a whole and that the purposes and objectives of personnel administration may be inferred from this relationship. In defining personnel functions in modern industry, reference may be made again to this relationship. The whole of modern industry is sometimes referred to as functionalized. Each participant and each specialized participating group in the process has a specialized task to perform. Owners save funds and invest them in capital goods. Managers, employed by the owners, control, direct, and coördinate the activities of the productive process, bringing together for this purpose the capital supplied by owners and the services supplied by workers. The latter make use of their varying degrees of technical skill in the operations which they perform.

In modern, large-scale industry this functionalization is frequently carried to great lengths, so that each major task of management is specialized and entrusted to a division

that can be charged with responsibility for its performance. Thus management may be organized, not on the basis of a *line* type of organization (patterned after the military model, with responsibility flowing directly from one level to the next, through individuals) or on the basis of the *line and staff* modification (in which responsibility is first divided for purposes of specialization and then re-united for administrative purposes), but on a purely functional basis. The trend in modern management is definitely in this direction, a development attributable largely to the influence of scientific management. The most commonly distinguished functions are those of: (1) analyzing operations, (2) planning, (3) routing, (4) setting standards, (5) inspecting, and (6) managing personnel.²

It is entirely possible to carry this distinction of function still further and thereby to describe the most important of the personnel functions in modern industry, since the functions of personnel management are rather readily distinguished and defined. They fall into four major classes, including: (1) securing personnel, (2) controlling working conditions in order to maintain and effectively utilize personnel after it has been secured, (3) providing various services to workers, seeking thereby to encourage self-improvement and increased efficiency, and (4) maintaining personnel records and personnel research.³

²See, in this connection, Dennison, Henry S., *Organization Engineering*, 1931; and "Functionalized Management" in *Recent Economic Changes*, New York, McGraw-Hill Book Company, Inc., 1932; also Dutton, H. P., *Principles of Organization*, New York, McGraw-Hill Book Company, Inc., 1931.

³See *Personnel Practices Governing Factory and Office Administration*, New York, National Industrial Conference Board, 1937; Bush, G. F., "Functions of the Personnel Department," *Personnel*, Vol. 9, No. 2, November, 1932, pp. 60-63; "Scientific Organization of a Department Store and Its Effects on Industrial Relations," *International Labour Review*, February, 1936, Vol. 33, pp. 194-226; Mathewson, Stanley B., "A Survey of Personnel Management in 195 Concerns," *Personnel Journal*, December, 1931, Vol. 10, No. 4, pp. 225-231; Gardiner, Glenn, "The Proper Job of the Personnel Department," *Personnel Journal*, March, 1936, Vol. 9, pp. 327-329; Parks, Donald S., *The Trend in Personnel Management, 1929-1936*, Toledo, University of Toledo, 1936.

Each of these divisions may be further divided to indicate the more specific tasks of personnel management. Thus, in securing personnel, the first task is that of job analysis—the determination of the numbers and types of employees needed. The discovery of suitable sources and the development of methods of recruiting follow, after which it is necessary to introduce or perfect devices facilitating selection and placement. Having discovered, selected, and placed new employees, the next step is to train them to perform their particular duties efficiently. These functions—job analysis, discovery and recruiting, selection and placement, and training—are logical divisions of the function described as securing personnel.

Possible subdivisions of the function of maintaining personnel are so numerous that an arbitrary selection from among them is essential. Among the most important, however, may be mentioned the following: analysis and investigation of unrest; discovery of the causes of unsatisfactory working situations; determination of the most satisfactory working hours; provision of a method of rating employees as a basis for compensation, transfer, and promotion; establishment of wage policies and methods; provision of systematic promotional arrangements; consideration of conditions affecting health and safety; maintenance of interest in the job and of discipline among employees; stabilization of employment; and provision of a satisfactory basis for collective bargaining. All these and others that should perhaps be mentioned represent necessary considerations involved in the maintenance of the labor supply in a modern business organization.

What have been described as service functions rendered the employees may or may not be extensive, depending upon the adequacy of public services of the same nature and the peculiar conditions affecting each industry or concern. In general, such provisions include arrangements for employee savings, loans, pensions, retirement provisions, medical facilities, housing, and such other services as may appear

necessary in order to facilitate normal, healthful, and reasonably satisfactory working and living conditions for workers and their families.

Finally, under the general heading of records and research, the personnel function includes the maintaining of all sorts of personnel records, by means of which all personnel policies may be evaluated and all employees identified and classified for purposes of compensation, promotion, and transfer. Records of absences, tardiness, accidents, and all other conditions affecting the efficiency of employees must be maintained. Meanwhile, constant investigation and valuation and revaluation of each and every phase of personnel policy to determine its effectiveness are essential. In other words, it is the constant duty of personnel management to weigh each wage plan, each schedule of working hours, each rating arrangement, to determine what its implications may be, how well it is serving the purpose for which it has been intended, and how it may be changed to make production more efficient and more generally satisfactory. This last function, as will be recognized with progressing study, is or should be one of the most extensive and time-consuming of all functions undertaken by those in charge of personnel. The ability of management to adapt itself to the constantly changing conditions of modern social and economic conditions depends in large measure upon the determination with which this research is carried on. Only by such constant, critical revaluation can personnel policies be kept abreast of the times.

Subsequent chapters follow this order in describing the functions of modern personnel administration.

The personnel audit. Many firms find it expedient to provide for regular reviews or audits of the personnel policies and practices affecting their employees. Such personnel audits will tend to indicate the extent to which policies conform to basic managerial objectives as well as to sound principles of personnel administration, and they provide an effective stimulus for continued improvement in the person-

nel program. The audit should investigate each of the important phases of administration. Its specific form may be suggested by the "Guide for Surveying the Operating Results of Personnel Offices," utilized by the Farm Credit Administration. That guide includes a check list for the evaluation of each of fourteen major divisions of personnel procedure, including:

1. Payroll approval procedure.
2. Selection.
3. Administration of classification plan.
4. Administration of compensation plan.
5. Minimum qualification standards.
6. System of employee ratings.
7. Service salary adjustment plan.
8. Promotion and transfer program.
9. Attendance control.
10. Termination procedure.
11. Training and educational program.
12. Employee service programs.
13. Personnel office reports and records.
14. General considerations.

Each of these major divisions of the entire program is rated on specific points to determine how well it is performing the function for which it has been created and what improvements appear desirable. Such an audit is obviously a most valuable tool in discovering both results of and shortcomings in the personnel program.

Professional training for personnel management. Consideration of the breadth and depth of these functions may raise the serious question as to whether or not personnel administration should regard itself as a profession and whether extensive undergraduate and graduate professional training should be provided. Doubtless, there is room for such a development, especially for the professional training of personnel counselors who may become so thoroughly grounded in the field that they can effectively consult with managements in a variety of industries as to their particular personnel problems. Certainly, it is time that old, rule-of-thumb procedures, analogous to the methods of medieval

medicine men, were discarded. Moreover, personnel counselors need professional training so that they may feel the usual professional responsibility to society in general for the measures they prescribe. Finally, there is great need in the field for the establishment of definite standards of performance by means of which malpractice of various sorts may be detected and identified. Such standards, cross-cutting the various fields of industry and business, will probably not appear until something similar to a professional status for specialists in personnel administration is attained. They are dependent upon the general development of personnel research programs in widely scattered industries, upon comparisons of the efficiency of various personnel policies in a variety of firms, and upon the expansion of the revaluation process beyond the limits of the individual firm and into the general field of industry and business. A development of this sort is in process and may be speeded up by the necessity for improving industrial relations in order to preserve political integrity.

Meanwhile, the need for a deeper understanding of personnel problems by all managers, not merely by personnel managers, is obvious, and the immediate need is for a more general appreciation of such problems and of methods of attacking them. All those who will shortly assume positions of responsibility in industry and business definitely require training of this type. Thus, for the immediate present, the desirable objective is a realization of the fact that all managers are personnel managers, and that they should familiarize themselves with the principles of effective personnel procedure and control.

Labor policy. From the viewpoint of any individual concern, the effective control of industrial relations requires the establishment and general understanding of a definite labor policy, in which the labor force is guaranteed a relationship to management that assures mutual understanding as a basis for continued cooperation. Numerous firms have sought to put such a policy into words, with greater or lesser

success. In essence, it must usually provide that employees be selected fairly, on a basis of their abilities as these correspond to labor needs; that they be appropriately trained for the work to be done; be reasonably compensated and promoted on the basis of ability and performance; be assured of a fair hearing for their grievances; be guaranteed that no discrimination among them will be made on the basis of religious or other affiliations; be assured that management will seek to anticipate the need for adjustments instead of waiting for dissatisfaction to develop; be promised working conditions as safe as is reasonably possible; and be guaranteed that no arbitrary discharge shall threaten an employee's security. Many firms go further and indicate their desire to pay wages somewhat above prevailing levels, while others propose formal machinery for consideration of employee grievances. Again, seniority rights may be recognized as a basis for advancement, provision may be made to regularize employees' wages throughout the year, or pension and retirement features may be emphasized.

Essential details to be included in the formulation of a labor policy must necessarily vary from one concern to another, but the basic element, the recognition of the value in a definite system of guiding principles, is the same. What is desirable, if modern industrial relations are to be successfully established and maintained, is an understanding, by management and employees alike, of the fundamental rules of the game; and a formal statement of these rules should assist in creating that understanding.⁴

Conclusion. Personnel administration has been defined, in this chapter, by reference to its relationship to management in general, its purposes, its methodology, its assumptions, and its particular functions in modern industry. It has been described as one functionalized division of modern management, a division that deals with the control of labor

⁴Hicks, Clarence J., "Essentials in an Industrial Relations Policy," *Address on Industrial Relations, 1937*, pp. 1-7. Ann Arbor: Bureau of Industrial Relations, University of Michigan, 1937.

power, as distinguished from all other types and sources of power. Its purpose has been said to be manipulation and control of labor power, to the end that the latter may be constrained to participate in the productive process in the most efficient manner possible. Its method is that of all applied science, involving the application of principles discovered by a variety of sciences to the solution of its particular problems. It assumes the necessity for capitalistic industry in modern society, although not necessarily private capitalism, and it also assumes that the most immediate and important interests of employers and employees are harmonious. It deals especially with the discovery, recruitment, maintenance, and constant improvement of the working force in industry.

A brief, descriptive account of the meaning, purposes, assumptions, and functions of modern personnel administration, such as has figured in the pages of this chapter, may readily encourage a mistaken notion of the simplicity with which a satisfactory program may be developed. Little has been suggested in the way of solutions to the large and small problems always encountered in establishing and maintaining an effective personnel program. One of the most common of such problems is that of securing unanimous understanding and approval, from all representatives of management, for a clearly formulated labor policy. Without such understanding and acceptance, there can be no adequate motivation for the specific personnel policies and practices that make up the more obvious features of a satisfactory industrial relations program. Moreover, without this support, wholehearted employee acceptance of and participation in the system can scarcely be expected. It must be clearly understood that all the functions of modern personnel management described in the preceding pages can be little more than empty gestures unless they are the overt manifestations of a carefully considered, soundly conceived labor policy.

It is not essential that such a policy be written or published, although it may be more carefully formulated if it is

put into definite words and phrases. So expressed, it gives vitality and force to the specific activities undertaken by those responsible for the administration of industrial relations, and at the same time it serves as a measuring stick in terms of which individual personnel policies and practices may be evaluated. It tends, in that way, to encourage a consistency in these policies that is highly desirable, although frequently lacking. Basic labor policy may hold, for instance, that management proposes to deal collectively with any organization representing a majority of all employees in any shop or craft. If so, it provides an elementary rule in terms of which bargaining practice at various times and places may be appraised. It may provide that wages shall be as high as or higher than the prevailing rates for the same occupations in competitive firms. In such cases its usefulness as a yardstick for evaluating specific wages is obvious. It may describe a policy that seeks to maintain or advance the purchasing power of employee earnings, or one that encourages promotion and advancement from within, or one that proposes to regularize employment and earnings throughout the year, or to preclude arbitrary discharge, to hold working hours within defined limits, or to provide security against dependent old age. In any case it sets standard in terms of which specific policies in particular cases may be weighed.

Fundamental to all personnel functions, therefore, is a clear-cut personnel policy, the vitalizing force in the whole program. Any worth-while system of industrial relations must begin with formulation of such a policy, and no program can advance far without its firm establishment and its understanding and acceptance by all those responsible in any way for relationships between management and working personnel.

Exercises

1. Prepare an outline of the major functions of modern personnel administration.

2. Show that modern personnel administration is neither reactionary nor paternalistic.

3. Prepare a brief or abstract of one of the articles mentioned in footnotes throughout the chapter.

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CHAPTER II

The Background of Personnel Administration

IT might be said that, in a sense, modern personnel administration has no history, for it is, in its present form, a comparatively recent development. In another sense, however, its history involves all the long series of stages through which the relationship of managers in industry and those whom they manage has developed to its present state. Whether or not this evolutionary development may be regarded as representing the historic beginnings of modern personnel administration, it is certainly the background from which the present practice has sprung, so that an understanding of that background may assist in the appreciation of the purposes and functions of the present-day practice.

Changing nature of industrial relations. The fact is apparent that modern employee-employer relations are distinctly different from those of earlier periods. Moreover, it is equally apparent that such relationships have undergone a long series of transformations. A brief description of these stages in the evolutionary process may assist in providing a more comprehensive understanding of modern personnel problems. Certainly such a review makes possible a perspective that tends to reduce existing prejudices and bias to lesser proportions. It assists in defining certain important parts of the traditional and cultural heritage in the midst of which industrial relations necessarily take place. Further, it forces a recognition of the dynamic nature of all institutions and human relationships, a characteristic that suggests the likelihood and necessity of continued evolutionary change. For all these reasons, it is worth while to examine briefly the

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background of modern personnel administration in historic employer-employee relationships.

Three fairly distinct periods may be noted in the process of change preceding the emergence of what may be regarded as modern industrial relationships. The first of these is that which preceded the Industrial Revolution, a long period of relatively slow change. Then follows the period of rapid modifications imposed by the revolution itself, and last a third period may be discerned in the years subsequent to the Industrial Revolution.

Pre-revolutionary relationships. In the period preceding the Industrial Revolution, change centers about the shift from serfdom to the emergence of guild organization. In the early part of the period, the most common type of employee-employer relationship was that in which employers were masters and employees were in effect slaves. This relationship most commonly began in military conquest, from which the master-slave relationship naturally followed. The slave thus acquired was a chattel, the personal property of his master, and the relationship involved all the wide range of attitudes from kindness to consummate cruelty, and from hatred to sincere affection observable in the slavery that characterized the United States prior to the Civil War. The services performed by slaves were similarly varied, ranging from menial tasks of all sorts to specialized responsibilities in agriculture and military service.

From this specialization of function, the status of the free artisan developed. As individual skills and crafts were found necessary, some artisans were able to purchase or otherwise establish their own independence, after which they sold their services or their products in somewhat the same manner as do independent craftsmen—shoemakers, tin-smiths, blacksmiths, and others—in modern society.

The group of free artisans was a distinct minority. The first craftsmen were predominantly either serfs or slaves. Serfs enjoyed a somewhat more favorable status than slaves, in that their position in the manorial system characteristic

of the period entitled them to certain fairly well-established rights. Their duties and obligations were defined largely in terms of quantities of produce which they should render to the master and of possible military service. Slaves were, as has been suggested, personal property, and their status was subject to the whims of masters and to caprice to a much greater degree than was that of serfs.

Independent artisans were wage workers, but their status differed essentially from that of modern workers, for they were not free to charge any wage they might wish. Wages were not, in other words, either strictly competitive or freely set by the worker and his customer. Rather, wages were determined by the all-powerful church authorities of the period. These authorities had developed an economic criterion which they described as that of a "fair price," and they applied this measure to personal services as well as to commodities. For the former, they held that a fair price was one that permitted the worker to live, to raise his family, and to maintain (not advance) his customary scale of living. To that end, wages of artisans were fixed at levels which were believed adequate for this purpose.

There was little mass unemployment among any of the several types of workers in this early period. Since no marketing process was involved in determining when and where most labor would be utilized, the problem of maintaining employment became largely a problem of organizing the work to be done and assigning workers to their tasks. On the whole, industrial relationships were simple rather than complex, and no extensive system of practices for equilibrating the desires of owners, managers, and workers was necessary.

The handicraft system. The period characterized by the existence of serfs, slaves, and a few free artisans is generally described as the agricultural period, so called because the predominant unit of production was the manor and the principal products were agricultural. With passing years, however, increasing numbers of artisans achieved a status of

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independence and sold their services for wages. Specialization of productive processes was increased, and independent craftsmen found their economic positions strengthened by this increasing specialization. In England, where this development appears most clearly, these independent workers began to organize their own associations as early as the thirteenth and fourteenth centuries, and similar associations, representing the beginnings of the craft guilds, appeared on the continent at almost the same time.

The improved status of these independent artisans attracted particular attention in England when, in the fall of 1348 and again in the spring of 1350, the Black Death (the bubonic plague) occasioned a great shortage of labor. It is estimated that almost one half of the working population in stricken areas was killed by the plague, and workers found their services in such demand that wages, slipping from established controls, began to rise. There followed a series of governmental edicts calculated to restrain this tendency. By order of the king, in 1349, workers were prohibited from asking an "unreasonable" wage, and the limits imposed were those of customary wages in the five years just preceding. Penalty for failure to observe the order was imprisonment.

Two years later, in 1351, Parliament enacted the first Statute of Laborers, which fixed wages and required workers to appear twice yearly and swear that they were observing these provisions. The law was reenacted thirteen times within the century. It was supplemented, in 1563, by the Statute of Apprentices, which made labor compulsory and empowered the local justices of the peace to set wages once per year. The act further set up a minimum apprenticeship requirement of seven years for a trade and established the length of the working day at twelve hours in summer and daylight hours in winter. While the details of the legislation are not, in themselves, so important, the particular significance of such legislation is, as Cheyney has said, the recognition of the existence of a distinct class of laborers.

Gild organizations. Gilds represented the first organizations of these independent workers. Their growth was slow,

extending over several centuries, but there early appeared a specialization of two types: the one made up of merchants who banded themselves together for the purpose of setting local standards of quality and of protecting themselves against competition from outside, and the other made up of specialized groups of craftsmen. The latter sought to control the number of workers in the crafts and to maintain certain standards of performance, both results to be achieved, in large measure, by regulation of apprenticeship requirements.

Within the organizations, clear-cut differentiation separated master craftsmen (the entrepreneurs of the system), journeymen (who were its wage workers), and apprentices. The latter characteristically worked for board, lodging, and a small allowance. Wages of journeymen were not freely competitive, for they, like working conditions and hours of employment, were not determined by any outside authority but by gild members themselves. Great emphasis was placed, in many of these organizations, upon fraternal benefits, and the origins of many modern trade-union benefits, including death, disability, and unemployment benefits, may be traced to the customary practices of the gilds.

It should be noted that the gild organization made no provision for what may be described as a permanent wage-earning class; rather, each member of the gild, if he were not already a master, might reasonably expect to become one. Apprentices, lowly as was their status, were embryonic journeymen and master craftsmen. Their attitudes and ideals may reasonably be assumed to have been adapted to this temporary nature of their position. No class of permanent wage earners comparable to that in modern industry featured the gild system.

The Industrial Revolution. The gild system disappeared as a result of the same changes that occasioned and characterized the so-called Industrial Revolution. Such changes were numerous, but among the most important were: (1) the gradual expansion of economic markets, chiefly attributable to improvements in and extension of means

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of transportation; (2) the increasing use of machines in place of hand tools; and (3) the requirement of greater capital with which to set up a shop as a master craftsman. The first two of these changes have been so widely described as to require no additional attention here, but the third deserves brief explanation. As machine tools were perfected, the competition among shops made such equipment essential, but its purchase required more capital than had formerly been necessary. Consequently, it became necessary for journeymen to remain longer in that capacity and to save more of their earnings, in order that they might secure the funds with which to set themselves up in business. At the same time, however, the master craftsmen in many trades, feeling the pressure of increasing production, determined to limit the number of new establishments by raising the requirements for entrance into their ranks. They increased initiation fees and used other similar devices to keep journeymen from achieving the status of master.

Yeomanry guilds. When journeymen, in increasing numbers, found it impossible to become masters, either because of their inability to secure adequate capital or because of restrictions imposed upon entrance to the master's status, they also discovered that the older guilds, in which masters, journeymen, and apprentices were represented, failed to meet their economic needs. Their position had become one in which they needed an association to deal for them and with masters rather than one in which masters, journeymen, and apprentices joined to protect mutual interests. Accordingly, yeomanry guilds—or associations of journeymen with the specific purpose of bargaining with their employers, the master craftsmen—became increasingly numerous.¹

These yeomanry guilds are of particular interest because they represent legitimate ancestors of modern labor organi-

¹It should be noted that yeomanry guilds did not originate at the time of the Industrial Revolution. Rather, they had appeared, in isolated instances, many centuries earlier, but they became common and attained their greatest prominence and significance during the later period.

zations. Their purposes, unlike those of the guilds, were closely akin to those of modern unions. The older guilds had sought to join employers and employees for the protection of mutual interests. The yeomanry guilds, on the contrary, joined journeymen, or employees, for the protection of their interests in dealing with their employers, the master craftsmen.

The "putting-out system." Changes in processes of production and the need for greater capital with which to purchase larger quantities of raw materials, together with the tendency of guilds to restrict the number of journeymen who were permitted to become masters, so modified the situation in which the old guild system had developed that many journeymen found it practically impossible to achieve the higher status. Rather, they were forced to continue as journeymen and to use tools and raw materials furnished by those who had already established themselves as master craftsmen.

In certain types of trades, however, a comparatively new system developed as a result of this interference with the established progression within the guilds. In such occupations, where hand work or work utilizing simple, personally owned tools predominated, traders undertook to finance production. They brought the raw materials to the craftsmen, hired the latter to process such materials upon a piece-rate basis, and then collected and sold the finished products. This arrangement was known as the "putting-out system." It represents what was in reality a preliminary step in the Industrial Revolution.

Industrial capitalism. The putting-out system involved what is frequently described as *trader capitalism*. In its most common arrangement, traders supplied the capital necessary to provide adequate quantities of raw materials and to hold finished products until they could be sold. It was but a short step from such an arrangement to *industrial capitalism*, or the factory system. That transition took place and represented the final stage in the Industrial Revolution. Trader capitalists, realizing the possibility of increasing economies

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in production by utilizing newly perfected machines, conceived the factory plan of production. Instead of "farming out" production to numerous small establishments, they installed machinery and offered employment at the factory. The home as a unit in the productive process was thus displaced by the factory, and the homemaker became a factory hand. The most dramatic of the phases of the Industrial Revolution was then complete.

Features of early capitalism. A number of the notable features of early industrial capitalism may be briefly mentioned, since they assist in developing a satisfactory perspective for evaluating present conditions in industry. There was, for instance, a widespread movement toward power sites, a movement that resulted in the formation of early industrial cities and gave rise to many of the novel social problems of the emerging community life, such as those of sanitation, infectious diseases, crowded housing, increased crime, and a general increase in sexual immorality.

At the same time, the new era effected a realignment of social classes. It caused the emergence of what has been described as the most impressive creation of the industrial revolution, the industrial proletariat—the group of wage workers, dependent upon others, their employers, for work and for the tools with which they performed their function in industry. Similarly, there was distinguished from this class another group made up of those who provided a working place and the tools with which to work, a class later generally referred to as the industrial capitalists.

The period was characterized, also, by the further acceptance of the physiocratic, *laissez-faire* philosophy. That point of view, a concomitant of the attack on authoritarianism in religion and in politics, found effective protagonists in such writers as Rousseau, Bentham, and Hobbes, and was supported, as a desirable economic philosophy, by the contributions of Malthus, Adam Smith, and others of the so-called classical school of economists.

The reflection of this *laissez-faire* philosophy is clearly evi-

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dent in early working conditions. Governmental regulation was almost totally lacking, on the theory that the greatest social benefits would accrue if there were no interference in economic processes. Employment was irregular, and wages became, for the time, generally competitive. There appeared to be little chance for the ordinary employee to emerge from the working class and become an employer. There was a vast increase in the use of female and child labor, made possible by the simplified operations resulting from machine production. In many cases, such inexperienced workers were preferred to the more experienced craftsmen, for the latter found it difficult to adapt themselves to machine methods. They were too frequently obsessed with ideals of craftsmanship and quality to fit in well with the newer emphasis upon mass production.

Living conditions in the early factory cities were unbelievably hazardous, while both living and working conditions were unsanitary and conducive to the spread of disease. Housing was hopelessly inadequate, with the result that several families were forced to occupy a single dwelling. Popular education was unknown, and children were put to work at an age now regarded as that at which they should begin schooling. There were almost no labor organizations, and efforts to band workers together for purposes of collective bargaining were punishable by law, as a crime.

On the other hand, the more general employment of women and children together with the reduced cost of numerous commodities, reductions made possible by new productive techniques, resulted in higher real family incomes. Effects of this increase soon became apparent, both in slight improvements in living scales and in higher birth rates among the working families. Furthermore, once the process was begun, the increasing productivity continued to grow as a result, on the one hand, of the more efficient use of labor power, and, on the other, of a continually growing capital-worker ratio, that is, more equipment and more power per employee. Both of these developments tended

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to make employees worth more, and they go far in explaining the continued rise in real wages throughout the nineteenth century.

Continued industrial expansion. The changes begun in the Industrial Revolution have, for the most part, continued throughout the years since. New inventions have appeared in accelerated tempo, thus increasing the effectiveness of labor. New lands have been thrown open to exploitation, thus advancing the ratio between other factors of production and labor, with consequent rises in real wages and living scales for workers. Increased profits and a concomitant growth in savings have had a similar result.

At the same time, popular education has become an important feature of modern life, a feature that has tended to increase the efficiency of labor at the same time that it has made former master-servant relationships between employers and employees increasingly intolerable. In an enforced recognition of this impossible situation, society has become increasingly tolerant of labor organization, so that unions, formerly forbidden by law, are now recognized as legal and proper in all modern industrial nations. As a result, increasing proportions of all employees have come to depend upon such organizations as their agents in bargaining with respect to wages, hours, and related working conditions, and far-reaching disputes between employers and their organizations, on the one hand, and unions of workers on the other, have come to feature modern industrial activity.

Meanwhile, also, the size of the usual productive unit has continued to grow. The individual proprietorship has given way to the partnership, and the latter has been replaced, in a large part of all modern industry, by the corporation. Absentee ownership has, as a result, become the general rule, with owners (stockholders) entrusting their property to hired executives (managers) and depending upon the latter to determine all policies with respect to the business. In many cases, the impersonal relationship between owners and employers on the one hand and employees on the other

is so complete that the ordinary stockholder knows nothing of his employees or of the conditions under which they work and generally gives no thought to such considerations. Rather, his interest lies in dividends and an appreciation in the value of his stock. The managers he employs are satisfactory only so long as these results obtain.

Management, in turn, feels this pressure for profits. It knows that its success, as well as its tenure, is dependent upon the profitable operation of the property, and it feels constrained to take whatever steps may appear necessary to insure or increase profitable operation. Since any reduction in labor costs may have this effect, there is continued downward pressure on wages.

Employees could scarcely be expected, under these circumstances, to develop great personal loyalties to employers, and large-scale business finds the absence of such loyalties one of its greatest liabilities. The impersonal relationships of corporate industry are, in other words, reflected in the attitudes of workers as well as in those of stockholders and management. There is a real chasm between stockholders and workers. The fact that in many cases their interests may be harmonious is not too apparent to either of the two groups, while the conflict between certain of their interests is likely to become a matter of conviction and emotional reaction to absentee-employer and worker alike.

Rise of personnel administration. Modern personnel administration owes its emergence rather directly to the last of the developments mentioned in the preceding paragraph. Its major objective, from its earlier beginnings, has been associated with the necessity of bridging the gap between owners and workers, taking the place of earlier personal, face-to-face relationships between these groups. Some of its exponents have sought to restore the intimate give-and-take of personal contacts, while others have attempted to find a suitable substitute for the rapidly vanishing, sentimental association. In its early beginnings, it has

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been associated with a variety of projects looking in one or another of these directions. Early employee representation plans, for instance, aimed at bringing worker and management together at the same time that they sought, in many cases, to prevent the growth of independent labor organization, regarded by many managers as tending to arraign workers and employers against each other.

Meanwhile, a number of other developments have focused popular attention upon the seriousness of personnel problems in modern industry. Such, for instance, was one of the results of the increasing attention given to what has been generally described as *scientific management*. The emphasis in this direction, generally credited in its early stages to F. W. Taylor and to Frank Gilbreth, attracted public attention in the first decade of the present century. Gilbreth was much interested in improving the technology of the construction industry, in which he was actively engaged. He made numerous experiments designed to reduce necessary human exertion in such processes, the most frequently mentioned being that in which bricks were placed at a level such that bricklayers avoided all stooping and reaching below the waist-level. Taylor had, since about 1890, been practicing and advocating a number of reforms in industrial management, many of which directly involved the management of labor. Several other engineers whose interests were captivated by the Taylor approach began to popularize their own contributions, and to expound the principles and philosophy of the new development. Among these were Barth, Gantt, Emerson, and Thompson. Many of Taylor's followers, greatly impressed by the potential economies to be gained from wider application of his methods, set themselves up as efficiency experts and made exorbitant claims for the beneficial effects of the new movement. Taylor, it should be said, was much more conservative than many of his would-be imitators, but the actions of the so-called efficiency experts of this period did much to

discredit the movement as well as to align organized labor in opposition to it.

Popular attention was not widely attracted to the movement until December, 1910, when the interest of the nation was aroused by a widely publicized statement, made in a hearing before the Interstate Commerce Commission, that the railroads of the nation could save a million dollars a day by utilizing the recognized techniques of modern scientific management. A year later, in 1911, Taylor presented the first comprehensive description of the principles he was advocating in his book, *The Principles of Scientific Management*.

Further attention to the possibilities of increased managerial efficiency was aroused when in 1912 Congress ordered a commission to investigate the practices of so-called scientific management. A subcommittee, led by Professor R. F. Hoxie, sought to discover the implications of the movement with respect to labor, and its report³ lists forty-one objections to the movement advanced by workers who were interviewed by the committee. Most important among these objections were four, which may be summarized as follows:

1. Scientific management aims at an unfair distribution of earnings, because it does not give labor the results of labor's increased efficiency.
2. It tends to ignore the human element in production, regarding workers as machines.
3. It proposes an industrial autocracy, since all planning is to be done by management, and workers are merely to follow instructions.
4. It is opposed to labor organization.

It is unquestionably true that many of these complaints were well founded in fact in the early years of the manage-

³ Hoxie, R. F., *Scientific Management and Labor*. New York: D. Appleton-Century Company, Inc., 1915.

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ment movement, and no small impetus to the development of modern personnel administration has come from the efforts of management to overcome these objections and to remove the reasons for them.

Meanwhile, numerous students of psychology had been impressed with the fact that distinctive psychological characteristics had much to do with workers' success and satisfaction in their jobs; that certain types were better adapted to particular occupations than others, and that both efficiency and morale might be improved by finding the appropriate worker for the job. Münsterberg, in 1913, published his *Psychology and Industrial Efficiency*, and numerous investigators followed the lead of Cattell in checking workers' intelligence by means of early testing devices. More specific psychological characteristics were noted and evaluated in research undertaken by a number of business concerns, notably the Boston Elevated Railway, and by several universities and colleges.

The World War encouraged a renewed application to problems of personnel efficiency, and agencies created during the war have continued to make extensive contributions to the field. Several of the European nations had already undertaken extensive research in efforts to place men in the most advantageous positions in military service, and when in 1917 the United States entered the war, this nation faced a similar problem. A Committee on the Classification of Personnel was established almost immediately and was charged with the duty of determining significant abilities of drafted as well as enlisted men. The committee developed the army intelligence tests and a variety of trade tests and rating scales to facilitate its work.

Recent developments. In England, the government had established, in 1915, a group known as the Health of Munitions Workers Committee. That committee was reorganized in 1918 as the Industrial Fatigue Research Board, and it was provided with permanent support from government funds. Now known as the Industrial Health Board, it has

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continued to the present time its extensive investigation of workers' health, industrial accidents, fatigue, industrial unrest, rest pauses and other means of alleviating fatigue, and numerous other related problems. At the same time, many valuable studies have emerged from the National Institute of Industrial Psychology, endowed by the British government in 1921.

Other foreign governments have evidenced a similar interest in the study of significant aspects of industrial relations, and their agencies have contributed extensively to the growth of modern personnel administration. Germany, for instance, has supported several research institutes devoted to such studies, and Russia established its Central Institute for the Science of Labor in 1920.

In this country, in the years since the war, governmental participation in the collection and analysis of pertinent personnel data has been limited largely to the work of public universities, although those charged with responsibility for the personnel program of the federal public services have undertaken some valuable investigations, as has the Bureau of Labor Statistics in the Department of Labor. In the main, however, the leadership in research in industrial relations, so far as it has been assumed by public agencies at all, has been confined to the graduate schools of various universities and their bureaus of business research.

Non-governmental agencies have, on the whole, been much more active in recent years. The outstanding contributions of private universities have been attributable to special divisions and departments, created and endowed to advance the study of personnel and related fields and typified by the Yale Institute of Human Relations, the Princeton Industrial Relations Section, and several other similar arrangements. In addition to the contributions of universities, the growing body of principles that make up the applied science of personnel administration has been augmented by the studies and investigations of numerous associations and organizations that are especially interested

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in personnel problems, among the most prominent being the American Management Association, the National Industrial Conference Board, the Personnel Research Federation (founded in 1922 through the joint action of the National Research Council, the Engineering Foundation, and the American Federation of Labor), and Industrial Relations Counselors (incorporated in 1926, with support from John D. Rockefeller, Jr.). Still other associations, interested primarily in special phases of modern industrial relations, are making extensive attacks on personnel problems. Typical of them are the National Safety Council (formed in 1913 by members of the Iron and Steel Engineers Association and interested mainly in industrial accidents and disease), the Russell Sage Foundation (mediation, arbitration, and public employment exchanges), the National Bureau of Economic Research (wages and labor organization), and numerous others devoted to the study of economic, psychological, and health problems or those involving mental hygiene, vocational guidance, labor organization, labor legislation, and similar, related aspects of the field.

In the decade before the recent depression, the prosperity of industry in the United States exerted both desirable and undesirable effects upon the new art of personnel administration. It made possible the subsidization of extensive research, but it also encouraged rather uncritical acceptance of personnel administration by numerous firms. Frequently, the value of personnel management was taken for granted, and personnel divisions were established without careful, critical evaluation of their possible functions and contributions. In the minds of many executives, the spectacular aspects of personnel management were emphasized out of all proportion to their significance in a well-rounded personnel program. Testing, for instance, was welcomed as a panacea for all sorts of problems, and tests were constructed and administered by those who did not understand either their essential nature or their limitations. Emphasis upon personnel guidance and personal advice to

individual employees overshadowed the fact that a large portion of all personnel problems are essentially group problems and that the latter require quite different types of analysis from that which is effective in assisting individuals to make desirable personal adjustments.

At the same time, numerous managements saw in personnel administration a device for expressing their good will toward employees and for furthering conscious or unconscious paternalistic programs. They sought, accordingly, personnel managers whose chief assets were the ability to remember names and faces, a penchant for slapping backs and radiating good fellowship, and a willingness to convince employees of the beneficence of their employer.

The effectiveness of such administrators and the real or imagined philanthropic programs they promoted was necessarily short-lived. Paternalism was, in many cases, not particularly offensive to workers until depression brought with it forces beyond the control of employers, forces that necessitated numerous lay-offs, discharges, and reductions in pay. Then, employees reacted strongly against it, and that sort of personnel administration, recognized by management as a luxury, was readily dispensed with. Accordingly, in the depression, many departments were greatly reduced or completely eliminated.

Not all personnel programs, by any means, were of the sort described. Rather, the period represents a development similar to the stage in the emergence of scientific management when a few "efficiency experts" popularized and over-sold the contributions of Taylor and his associates. Many programs, however, represented carefully calculated, balanced approaches to the whole range of personnel problems. They became increasingly valuable when business recession placed additional premiums on efficient management, and alert employers expanded rather than contracted the activities of such personnel departments. The latter faced and overcame many of the new problems created by depression, and they conclusively demonstrated the long-

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time worth of the applied science. Their importance was further enhanced when the National Industrial Recovery Act and National Labor Relations Act forced rapid readjustments in labor relations, and they have continued to gain in value and accomplishment as expanding labor organization and the development of protective legislation for labor have brought increasing complexities into modern employee-employer relationships.

Post-depression tendencies. The personnel administration that has emerged from the depression is, as has been suggested, quite different from much of that which featured the postwar decade. It has lost much of its spectacular, glamorous appeal. It has passed the miracle-working, "efficiency expert" stage. It is not overwhelmed by impressive files of well-documented forms, by trick testing apparatus, by more or less complicated wage formulas and related promotional systems. It recognizes that all these and many more devices may have a place in a well-rounded program, but it has gained in perspective so that these items do not obscure the general breadth of the field. Rather, it sees its problems as beginning with a determination of labor needs; extending throughout an analysis of sources and methods of selection; considering a wide variety of types and methods of remuneration; laying a well-founded basis for promotions; dealing frankly with organized labor; and, in short, seeing to it that every contact with employees, from their original employment to their separation from the payroll, results in their greatest long-time contribution to the work for which they are employed.

Modern personnel administration has, accordingly, lost much of its attraction for certain types of persons who formerly surged toward it as the one vocational opportunity in which they were interested. It appears clearly now to be much more prosaic, much more a matter of careful thinking and hard work. Less handshaking and more brow-wrinkling, less sympathetic emotionalism and more hard-headed consideration are the order of the day. Industry has gradu-

ally come to realize that employees generally prefer to buy their own food rather than to have it given to them in a spirit of pious paternalism. That means, in effect, that modern personnel administration must concern itself with the maintenance of employment and wages rather than with gestures of good will.

Such attitudes and objectives should remove organized labor's opposition to personnel administration. The latter is in no sense opposed to unionism. Rather, as has been evidenced in numerous cases of union-management cooperation, modern personnel management can and will prove to be beneficial to labor organizations at the same time that it advances the interests of management.

Most striking, perhaps, of the recent trends in personnel administration is the increasing recognition of the fact that it is not enough merely to establish a personnel department. It is essential that all managers in both large and small industries recognize the fact that they constantly manage personnel, that they need to understand and practice intelligent personnel policies. Labor costs are, by and large, greater than all other costs of production combined, and it is patently ridiculous to train managers to deal with a host of other types of managerial problems without giving them even an introduction to those which involve their greatest costs as well as their widest possibilities for savings and economies.

It is not, of course, possible to give every manager a full familiarity with the entire field of personnel relations. It is, on the other hand, quite possible to acquaint him with the objectives, the point of view, and the general approach with which modern personnel management attacks its problems. Meanwhile, those who are to have major responsibility for personnel policies must be willing to forget the glamour of back-slapping, handshaking, and vicarious participation in all the misfortunes and adventures of employees whom they might console and advise; they must be willing to acquaint themselves with all the ramifications of

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the field, to develop what must shortly be recognized as a professional status, and to turn to the cold calculating evaluation of various lengths of working days, of various types of training, of wage plans and policies, of sources, of selective devices, of pension plans, of accident prevention programs, and of a vast array of related everyday problems of modern personnel administration.

Exercises

1. Prepare a brief report on the work of F. W. Taylor in advancing scientific management.
2. Describe the major trends or tendencies in personnel administration since the time of the World War.

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CHAPTER III

Approaches to the Study of Industrial Relations

THERE is no single comprehensive approach to the study of modern industrial relations. On the contrary, there are numerous types of problems involved in the phenomena of labor relationships, and profitable approaches are as numerous and varied as are these types. What is most important, therefore, is that students shall recognize each of the most commonly encountered approaches and shall appreciate their possible contributions. When the nature and significance of each such approach is understood, the student may more clearly define both the objectives and the limitations of his study.

As has been suggested, the most common approaches to the problems of industrial relations may be distinguished by reference to the types of problems they investigate. One such approach, for instance, emphasizes social problems, that is, situations in which certain aspects of labor relations are regarded as dangerous or harmful to society as a whole. Another type of approach is concerned with the wide range of scientific problems that underlie the more obvious social problems. Such an approach might, for instance, seek to explain the economic, or psychological, or sociological problems inherent in various aspects of labor relations. Still another approach gives major attention to the practical problems of business administration and management, as the latter are distinguished from either social or scientific problems. Each of these types of approach receives more

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extended consideration in the subsequent sections of this chapter.

Social problems. There is widespread public interest, at the present time, in the social problems that arise in and from industrial relations. Evidence of that interest is apparent, both from the prominent discussion of labor problems in newspapers and magazines and from the recently enacted and proposed legislation relevant to such problems. Typical of these social problems are unemployment, long hours, low living scales, child labor, and numerous others. The type of approach involved in the study of these problems is illustrated in most college courses in labor problems. This approach seeks to point out situations in industry which, from the standpoint of modern society, appear to contradict current ideals as to living and working conditions, and it usually attempts to describe social reforms, such as unemployment insurance, old-age pensions, compulsory dismissal wages, family allowances, hour legislation, collective bargaining provisions, and other similar social changes that are advanced as possible remedial measures.

Scientific problems. A second type of approach is interested primarily in the scientific problems that underlie modern industrial relations. Such problems represent so-called cause and effect or sequential relationships, and they represent situations in which such relationships are not yet clearly defined. Personnel problems involve many different kinds of causal relationships, some of them economic, some psychological, some physiological, and still others that are sociological in nature, to mention only the sciences that are represented prominently. These problems are so distinctive that it is desirable to consider, in some detail, the nature of each of these most important types of scientific approach. Because so much of the present interest in personnel administration is attributable to the contributions of psychology, logically the psychological approach is considered first.

Psychological problems. The types of personnel problems in which psychology has been interested have changed as the science of psychology has matured. In its simplest form, modern psychological analysis seeks to identify and measure distinctive personal responses to a variety of stimuli. Some years ago, great emphasis was placed upon the discovery and recognition of basic motivations, that is, fundamental drives, urges, appetites, instincts, and predispositions, on the theory that industrial situations should be so defined as to appeal to such forces rather than to antagonize or repress them, that economic activity must provide an adequate opportunity for the expression of all these elementary human demands. A considerable literature was built up about this point of view as an approach to industrial relations, a literature typified by Carleton Parker's *The Casual Laborer and Other Essays*,¹ Helen Marot's *The Creative Impulse in Industry*,² Ordway Tead's *Instincts in Industry*,³ and Veblen's *The Instinct of Workmanship*. Interest in this type of study waned, however, as it became apparent that there was no agreement among exponents of the theories involved as to either the number or the definite characteristics of the instincts. Moreover, they came to be used by many careless and uninformed backers of various reforms, by whom it was alleged that these theories would explain all sorts of behavior, much of which was patently explainable in terms of experience rather than innate psychological or neurological make-up.

¹ New York, Harcourt, Brace & Company, Inc., 1919.

² New York, E. P. Dutton & Co., Inc., 1918.

³ Boston, Houghton Mifflin Company, 1918. See also, Dewey, John, *Human Nature and Conduct*, New York, Henry Holt & Company, Inc., 1922; Watts, Frank, *An Introduction to the Psychological Problems of Industry*, New York, The Macmillan Company; Williams, Whiting, *Main Springs of Men*, New York, Charles Scribner's Sons, 1925; Kornhauser, A. W., "The Motives in Industry Problem," *Annals of the American Academy*, 1923, Vol. 110, pp. 113-116; Troland, Leonard Thompson, *Fundamentals of Human Motivation*, New York, D. Van Nostrand Company, Inc., 1926; Dana, Richard T., *The Human Machine in Industry*, New York, Codex Book Co., 1927.

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With the development of intelligence tests and with particularly widespread application of such tests during the period of the World War, emphasis shifted to studies of intelligence. This type of analysis continues to be productive in determining levels of intelligence that are appropriate for various types of work, and it has recently sought to distinguish types of intelligence as a basis for differentiation in placement. Thus certain workers are found to be "p severators," a type particularly valuable in some fields of endeavor. Other workers are found to be characterized by greater theoretical intelligence, greater ability to reason abstractly, while still others may show greater ability in dealing with immediate or manipulative problems. It will be apparent that, since intelligence is so closely associated with performance on the job, studies of levels and types of intelligence may contribute much to satisfactory selection and placement as well as to the determination of sound bases for promotion and related aspects of personnel management.

Still more recently, psychological interest in personnel problems has emphasized the discovery, identification, and measurement of all kinds of individual differences and specific characteristics. Thus, attention is given to such specialized traits as visual acuity, learning speed, self-control, memory, imagination, reasoning power, emotional stability

*See, as illustrating this type of approach, Beckham, Albert S., "Minimum Intelligence Levels for Several Occupations," *Personnel Journal*, 16 Vol. 9, No. 4, pp. 309-313; Myers, C. S., "Some Recent Researches in Great Britain on the Psychology of Work," *Journal of the National Institute of Industrial Psychology*, October, 1931, Vol. 5, No. 8; Elton, P. M., and Hersey, Rexford B., "Worker's Emotions in Shop and Home," *University of Pennsylvania Industrial Research Studies*, June, 1932, No. 18; Trexler, J. A., "Mechanization and Skill," *Journal of the National Institute of Industrial Psychology*, October, 1931, Vol. 5, No. 8, pp. 442-449; "Evidence on the Value of Psychology Applied to Vocational Guidance," *Journal of Industrial Psychology*, January, 1929, Vol. 4, pp. 295-301; Plaut, Paul, "Psychologie und Arbeitswissenschaft," *Zeitschrift für Angewandte Psychologie*, 1930, Vol. 36, No. 1-2, pp. 87-103; Lovekin, Osgood S., "The Quantitative Measurement of Human Efficiency Under Factory Conditions," *Journal of Industrial Hygiene*, April, 1930, Vol. 12, No. 4, pp. 167-187; Kornhauser, A. W., "Industrial Psychology in England, Germany, and the United States," *Personnel Journal*, April, 1930, Vol. 8, No. 6, pp. 434.

interests, and similar individual characteristics.⁵ With respect to each of these, effort is made to measure the characteristic and to determine to what extent it plays a part in conditioning the behavior of the individual.

As psychiatry has developed, attention has been directed also to emotional and mental states characterizing individuals, and investigation has sought to disclose the nature of reveries, temperaments, and moods. The psychiatric approach is distinguished by its emphasis upon subjective rather than objective data and by its attempt to describe, in minute detail, the thinking and emotional processes of the individual.⁶

It will be apparent that many of the scientific problems studied by psychology and psychiatry have a direct bearing upon personnel problems encountered in business and industry. Discovery and measurement of personal characteristics of all types lay a substantial foundation for selection and placement, and an understanding of these characteristics may help also to explain maladjustment and dissatisfaction with a job. A knowledge of the desires and wishes of individual workers is important in determining effective incentives and financial as well as non-financial compensation. Measurement of certain qualities is highly important as a basis for promotion to positions requiring managerial or administrative ability; and these measurements are significant also in selecting candidates for training schools and

⁵ See, as illustrating this type of analysis, Myers, C. S., "Contribution of Psychology to Industrial Relationships," *Report of First Triennial Congress, International Industrial Relations Association*, January, 1929, Part 2, pp. 99-108; Bingham, W. V., "Industrial Psychology," *Bulletin of the Taylor Society*, October, 1928, Vol. 13, No. 5, pp. 187-198; Bingham, W. V., "Achievements of Industrial Psychology," *Mental Hygiene*, April, 1930, Vol. 14, No. 2, pp. 369-383; Hersey, Rexford B., "Periodic Emotional Changes in Male Workers," *Personnel Journal*, April, 1929, Vol. 7, No. 6, pp. 459-464.

⁶ See, Anderson, V. V., *Psychiatry in Industry*, New York, Harper & Brothers, 1929; Anderson, V. V., "The Problem Employee: His Study and Treatment," *Personnel Journal*, October, 1928, Vol. 7, No. 3, pp. 203-225; Viteles, M. S., *Industrial Psychology*, New York, W. W. Norton & Company, Inc., 1932; Appel, K. E., "Psychology in Industry," *Occupational Therapy and Rehabilitation*, August, 1931, Vol. 10, No. 4, pp. 207-216.

other avenues toward advancement. Distinctions developed by such investigation may be effectively utilized in preparing and developing systems of rating, and measurement of individual characteristics may assist in the reduction of fatigue as well as industrial accidents. The distinction of psychological types provides an additional group of categories by means of which workers may be catalogued to aid personnel investigations of unrest, absenteeism, tardiness, performance, employment stability and a host of other everyday personnel problems.⁷

Physiological problems. Increasing attention is being given to the investigation of physiological problems underlying modern industrial relationships. Fundamentally, all such investigation seeks to measure the physiological adaptation of the worker to his job. It aims to provide simple measurements of important physiological characteristics, such as strength, stamina, and physical fatigue of the individual, and, more particularly, to measure the strength of arms, legs, hands, back, and limited physical features that may be of special importance in particular types of work. At the same time, it seeks to discover and identify weaknesses and tendencies toward various types of occupational disease, to note effects of various diets, types of clothing, and working conditions, to measure the significance, for particular jobs, of the physical differences of the sexes and of different ages.

A beginning in this field was made by the British Health of Munitions Workers Committee, and a new impetus has recently been given such investigation, both in this country and abroad, by the more general provision of public health insurance and coverage for industrial disease under workmen's compensation laws.

Sociological problems. Many of the scientific problems underlying the practical problems of day-to-day personnel

⁷ See Farmer, Eric, "Psychological Study of Accident Proneness," *Personnel Journal*, August, 1930, Vol. 9, No. 2, pp. 115-120; Miles, G. H. "The Psychology of Accidents," *Journal of the National Institute of Industrial Psychology*, October, 1930, Vol. 5, No. 4, pp. 183-192.

control are sociological in nature. They involve behavior that is conditioned by culture, institutions, customs, folkways, and other aspects of tradition. Moreover, they are group phenomena rather than individual behavior, and they must be analyzed in terms of group characteristics, that is, current attitudes, group opinions, and similar features, rather than in terms of individual characteristics. A large part of the behavior involved in strikes and union activities is of this sort, and it is probable that a vast realm of less spectacular behavior is explainable only in terms of group characteristics.

Certainly, one of the ever-present problems of personnel administration is that of maintaining an effective morale throughout the whole organization, securing teamwork, maintaining loyalty, detecting and utilizing leadership, and understanding the points of view with which the whole working force regards administrative policies and practices. For such group analysis, the approach of sociology is most effective, and numerous investigations of these problems attest its usefulness.⁸

Economic problems. Economics finds an almost innumerable array of problems in modern industrial relations. It is interested in all aspects of group behavior that involve efforts to satisfy material wants, and it seeks to discover and define the processes by which this objective is attempted or attained. It aims, for instance, at an understanding of the true relationship between profits and wages, at the measurement of conditions that determine wage payments to various groups and types of workers, at discovery of the incidence of payroll taxes for old-age and other benefits, at evaluation of the relationship between wage rates and the stability of employment, and at various related problems

⁸ See, as illustrative of this type of analysis, Kornhauser, Arthur W., and Sharp, Agnes S., "Employee Attitudes," *Personnel Journal*, April, 1932, Vol. 10, No. 6, pp. 393-404; Houser, J. David, *What the Employee Thinks*, Cambridge, Harvard University Press, 1927; Culpin, Millais, and Smith, May, *Nervous Temperament*, London, Industrial Health Research Board, 1930; Feldman, Herman, *Racial Factors in American Industry*, New York, Harper & Brothers, 1931.

upon the solution of which depends the effectiveness of numerous personnel processes and programs. It seeks to measure the productivity of labor, the nature of changes in wages, living costs, and real wages, and the relationship between changes in productivity and fluctuations in workers' earnings. It attempts to evaluate the economic implications of various aspects of governmental intervention in economic processes, illustrated by minimum wage laws, arbitrary restrictions on working hours, and similar labor legislation. In general, it seeks constantly to discover in what ways labor power may be most efficiently utilized in these processes.

From its beginnings, economics has maintained the interest in labor and its efficient utilization described in the preceding paragraphs. Among the earliest of the classical economists, Smith and Ricardo displayed an extensive interest in the principles by which wages, hours, and working conditions were determined, and a similar interest is equally apparent in the studies of present-day economists. It is probable that more attention has been given to such features than to any other type of scientific problem underlying the personnel field, and the literature is so extensive that any sample would be entirely inadequate.⁹

In general, it may be said that the various scientific approaches described in preceding paragraphs are but illustrations of the numerous possible approaches to the field of any applied science such as personnel administration. Doubtless there are many other types of scientific problems underlying the managerial problems of personnel, and those suggested in preceding paragraphs are only the most widely recognized at the present time. Possibly, as the field de-

⁹ See, however, as illustrating the type of analysis that is being undertaken, Douglas, Paul H., *A Theory of Wages*, New York, The Macmillan Company, 1934; Hansen, Alvin H., et al., *A Program for Unemployment Insurance and Relief in the United States*, Minneapolis, University of Minnesota Press, 1934; Yoder, Dale, "Some Economic Implications of Unemployment Insurance," *Quarterly Journal of Economics*, August, 1931, Vol. 45, pp. 622-639; Douglas, Paul H., and Director, Aaron, *The Problem of Unemployment*, New York, The Macmillan Company, 1931.

velops, it may be found profitable to approach it from the point of view of the biologist, the chemist, and representatives of other sciences. The point is that society has only begun to realize that it is socially and commercially profitable to study the human power of industry as well as the inanimate and animate non-human sources, so that the length and breadth of scientific investigation in the field of personnel are not yet at all clearly defined.

The approach of business. Contrasted with the approach which society makes to its labor problems and that which science makes to the specific scientific problems it finds in modern industrial relations is the point of view with which modern business approaches its personnel problems. To begin with, business is primarily interested in profits. It seeks so to utilize its personnel power as to secure maximum long-time returns on the costs of such power. To that end, it looks to every aspect of labor management to determine how each may contribute most to its basic, long-time objective—maximum efficiency in the use of labor.

From the standpoint of business, every aspect of personnel relations represents an opportunity to further this major objective, and every scientific contribution is welcomed as an aid in that direction. Any scientific investigation that indicates a possibility of increasing efficiency in the use of labor power, whether such investigation be physiological, sociological, economic, psychological, or representative of some other scientific approach, is recognized as of value from the standpoint of sound business administration, and the alert, intelligent executive welcomes all such assistance in improving management and industrial relations.

Alert business administration does not, however, passively await contributions to an understanding of its personnel problems from such sources. Rather, it engages in a process of constant investigation and experimentation on its own account. It recognizes that many of its problems may be peculiar to its own locality, industry, and firm. Accordingly, it engages in a continuing critical examination of all its

managerial policies and practices affecting personnel. It evaluates each such feature of management to try to discover a measure of its effectiveness and to ascertain how, in the light of available scientific understanding of underlying principles of sound management, such policies may be made more effective in securing maximum long-time returns from the labor power that is involved.

In a very real sense, therefore, modern personnel administration may be described as "human engineering." It is the engineering of labor power. It is paralleled, in the duties of management, by the engineering of other sources of power, the adaptation of steam, water, or electric power to the needs and facilities of the plant. Just as intelligent management carefully selects an appropriate size and design in a motor to perform a given operation, so it seeks to select an appropriate type of person to fill a given position. Moreover, just as management considers the conditions under which the motor is to perform and attempts to regulate those conditions so that the effective power of the motor may be utilized to greatest advantage, so it considers the conditions under which the individual worker and groups of workers may work most efficiently, and it seeks to approximate, as closely as possible, those working conditions. Just as it regards the situation in which the motor performs its function from the standpoint of the maximum effective life time of the motor, so it evaluates the surroundings of employees, in terms of physical conditions and managerial policies and practices, from the standpoint of maximum life-time labor performance.

All of this is not to say, of course, that management makes no distinction between animate and inanimate sources of power, that it ignores the essentially human characteristics of workers. Rather, the contrary is true, for intelligent management not only recognizes the fact that workers are human beings but also realizes that, because of this fact, the human engineering involved in modern personnel management is by all odds the most complicated phase of man-

agement. Operating characteristics of the electric motor mentioned in a preceding paragraph remain fairly constant from day to day and from year to year. The characteristics of the human beings that provide the labor power of industry, on the other hand, change constantly, as physical and mental changes affect individuals and as new ideas, attitudes, and opinions circulate among workers. Moreover, the characteristics of human workers are infinitely more complex than those of even the most complicated machine. The whole problem of human engineering is, therefore, a challenge to the keenest minds of any business organization, and the field is one for which adequate training is both difficult to secure and, at the same time, highly worth while. The field requires much more than the mere desire to "work with people," more than a sentimental sympathy for "downtrodden wage-slaves," for it necessitates a critical mind, consummate curiosity, an analytical attitude, a vast tolerance and willingness to discard old, established managerial beliefs and devices that have been proved ineffective, and an unceasing determination to discover the value, from the standpoint of personnel control, of every significant phase of managerial policy and practice.

Individual and group problems. In the practice of modern personnel administration, two fairly distinct types of problems are constantly encountered. One type consists of individual problems, in which a particular worker is under consideration, because of his failure to meet the requirements and responsibilities of his position. Investigation of acute maladjustments may disclose a physical disability, or an unsatisfactory home and family situation, or an energy-consuming, attention-diverting worry about debt, or some other distinctly personal problem. In certain cases, the individual may be emotionally unstable, the victim of disturbing complexes or neuroses which disqualify him for effective participation in the work to which he has been assigned.

Such situations represent, however, only the pathological

aspects of individual problems. There are numerous other aspects of personnel procedure where the problems encountered are distinctly personal, that is, where they are concerned with the differences that distinguish individuals. Thus, the whole field of selection of new employees requires detailed consideration of such individual differences, as does the selection of candidates for training, for promotion, for transfer, and for all kinds of specialized tasks. In the past, such considerations were important in adjusting compensation to performance, but this relationship has become less important as collective bargaining has come to specify union scales of compensation and as line production has made individual differences in production less common.

In all pathological cases, the general method of approach that is appropriate may be described as that of individual case study.¹⁰ If the condition is acutely pathological, that is, threatening the complete personal disorganization of the individual, then it may be necessary to refer the case to a qualified psychiatrist, or, if a physical disability is involved, the case may be referred to a physician for diagnosis and treatment. For that vast realm of individual problems that involve neither of these characteristics but arise out of social situations that prey upon the worker's mind, infest his reverie, and interfere with his efficient performance, personal interviews have long been the approved treatment, although it is likely that many such cases should be referred, where it is possible, to a trained social case worker. For most firms, much of this interviewing and counseling will have to be done by the person in charge of personnel.

In earlier stages of personnel administration, this personal counseling on individual problems was regarded as the major and most important function of personnel executives. No one knows, of course, how general such personal problems may be among employees, although investigations by

¹⁰ See, Voorhees, Nelson A., "A Validation of the Case Study Method in the Vocational Guidance of Rehabilitated Persons," *Rehabilitation Review*, August, 1931, Vol. 5, No. 8, pp. 187-194.

psychiatrists have concluded that, in some firms, as many as twenty to twenty-five per cent of all employees are "problem" cases. More recent developments have, however, tended to reduce the attention given such cases by personnel executives, probably because, in most firms, the elaborate treatment necessary to rectify them is not available and will not become available until public provision is made to supply clinical attention and advice. Meanwhile, however, the reality of non-pathological personal problems cannot be overlooked. Business is replete with such problems. One large aspect of all personnel control, therefore, is and must continue to be concerned with the identification and measurement of distinctive individual differences.

At the same time, modern personnel administration faces many problems that are distinctly group problems. In other words, in addition to the emphasis notable in early stages of personnel administration which tended to stress the duties of personnel executives as personal counselors and advisors, modern personnel management recognizes a continually growing responsibility to consider *group* problems, conditions of employment that affect the efficiency of large numbers of employees, readily distinguished from the personal problems of individual workers. Of this second type, for instance, is the problem of retirement allowances, or that of life insurance provisions, or that of wage adequacy. In other words, efficiency in the use of labor power requires not only that individual workers shall be assisted in making satisfactory personal adjustments to their positions in the plant, the home, and society, but also that the conditions of employment imposed upon all workers shall meet certain tests of adequacy, that management of labor in the aggregate shall be sound and established upon a firm foundation.

It is important, for example, that employees be selected from sources known to furnish the best types for the work to be done; that they shall represent groups or types of workers that have been found to be most desirable; that

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they shall be trained by methods known, on the whole, to be most effective; that they shall be compensated upon a basis that takes account of such considerations as aggregate changes in living costs; that their earnings, as a whole, shall compare favorably with those of other workers in similar positions; that working hours and working surroundings, by and large, shall be appropriate to the work to be done; that employment, for employees as a group, shall be steady and secure. The list of such problems could be extended indefinitely, as later pages will indicate, but the essential point should be clear from these illustrations. There are numerous and increasing problems facing those in charge of personnel that are essentially group problems, in which employees must be considered in the aggregate. This condition is doubtless attributable, at least in large measure, to the continued growth of large-scale production, and it is precisely in the larger enterprises that personnel management is finding and always has found its greatest problems and its greatest opportunities.

The development of labor organization that has accompanied the growth of industrial and commercial organization has exerted a similar effect. As unions have come to represent increasing numbers of workers, they have emphasized their desire that management deal with them as groups rather than as individuals. In part, this attitude represents a rather natural reaction against the paternalistic features of earlier managerial efforts; in part, it is a normal phase of union policy. Many managements are entirely aware of this highly significant change, as is evidenced by the following excerpt from a bulletin of a retail management association:

The conclusion reached by the conference from these considerations was that management should cease thinking of a worker as an individual "economic man," who is always trying to get as much as possible for as little as possible, and who sometimes gangs up with others similarly motivated. It should turn its attention to the social structures developed by employees inside the plant, and try to understand their

nature. Then will management be on the way to deal with the realities of life, instead of with an accumulation of non-existent logical "economic men."

A similar conception of the need for a group approach was recently voiced in a mid-western conference on industrial relations. One speaker described this new approach in industrial relations as follows:

Good personnel management in the future will mean, not only a continued attack upon internal discrepancies and frictions, but must also include a recognition of the principle that the worker feels himself in the relationship not only of an employee, but also as a member of a group, and that his interests now go beyond his own income, his own working conditions, and his own relationships with his immediate superiors. They now go to the point where, if necessary, he will make sacrifices in the interest of the group, feeling that thus his own interests will be protected when he has need for that protection.¹¹

Just as the treatment of individual problems makes use of the device of individual case study, including interviewing and counseling, so the treatment of group problems makes extensive use of statistical tools. Group problems require an approach in terms of aggregates. Many students of personnel administration are already familiar with the tools necessary in such an approach. For such students, the chapter immediately following will provide a hasty review. For those who are not acquainted with these essential tools, that chapter summarizes the simplest and most useful of such techniques. Their use in connection with the discovery, analysis, and treatment of specific personnel problems will be extensively illustrated in subsequent chapters.

Exercises

1. Prepare an outline distinguishing each of the types of approaches described in this chapter.
2. Contrast appropriate approaches to individual and group problems.

¹¹ McCarthy, H. L., "Collective Bargaining," *Addresses in Industrial Relations, 1937*, pp. 33-38. Ann Arbor: Bureau of Industrial Relations, University of Michigan.

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Collateral Reading

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CHAPTER IV.

Simple Statistical Tools for Personnel Analysis

IT has been indicated, in the closing paragraphs of the preceding chapter, that problems involved in the efficient control of labor power in business and industry include, for the most part, two general types: one, those of individual, personal adjustment; the other, those characteristic of larger or smaller groups of employees. In numerous cases, of course, the two types of problems are closely related or combined; they may, in fact, be merely different aspects of the same basic, underlying condition. Thus the problem of adequacy of wages has both individual and group aspects. The two are, however, separable, and the approaches to each of these aspects must necessarily be distinct and different in nature.

The appropriate method of approach to problems of the first type is unquestionably that of individual case study. Such analysis must be depended upon for a satisfactory understanding of many personnel problems. The second type of problem, however, that which involves situations affecting larger or smaller groups among the total of employees, can not be successfully analyzed in terms of the individual workers affected. Rather, analysis must proceed in terms of the groups or aggregates themselves. It must depend upon measures of average or typical features, the range of prevailing conditions, the general characteristics of the situation, averages of wages and hours, types of workers (in terms of education, intelligence or other characteristics)—in short, upon the nature of over-all, *composite* relation-

ships, rather than in terms of specific individual or personal features and conditions.

Analysis of such group problems necessarily makes up a large portion of all personnel investigation and provides the basis for a large share of all carefully determined, permanent personnel policies. Only by such analysis, for instance, can wages be evaluated in terms of changes in the general level of retail prices, or, more specifically, in terms of the prices of goods in the worker's budget. Similarly, only by such means can different lengths of the working day, different wage systems, or the effects of training systems, promotional plans, and numerous other managerial policies and practices be accurately evaluated in terms of employee reactions and productivity. No reasonable amount of individual case study could be depended upon to provide a reliable factual basis for the solution of such problems, although, certainly, individual case study may represent a highly important part in the process of evaluation and may actually lay the foundation upon which more comprehensive group analysis is based. The study of workers' living costs, for instance, logically begins with the analysis of family budgets, and it progresses, upon this foundation, to the calculation of index numbers applicable to conditions affecting the whole group.

It is for reasons such as those just described that attention is directed, at the outset of the study of modern personnel control, to the general nature of the simpler tools by means of which the extent and significance of conditions affecting groups of workers may be discovered and measured. Such tools are not at all limited in their applicability and usefulness to research phases of industrial relations. On the contrary, they are an essential part of the equipment of those who must deal with the everyday, practical problems of selection, compensation, promotion, and numerous other phases of personnel administration. From one angle, they might be regarded as the tools of personnel accounting. They enable management to strike a trial balance of personnel policies and their effects, and they are as essential

to the continual evaluation of managerial policies affecting industrial relations as are the similar accounting tools to the measurement of assets and liabilities.¹

On the other hand, no elaborate or extended description of such statistical tools would be appropriate here, and none is included. Rather, it is intended to mention and describe briefly only the simplest and most commonly used of these devices. Several of them are accorded additional attention in later chapters, where their use is illustrated by reference to various data typical of the industrial relations field.

Graphic representation. There are numerous situations in which graphic representations may be used to advantage in describing or explaining conditions affecting personnel, as is suggested by the charts that appear in this and later chapters. Bar charts, curves of various sorts, pie charts, maps, progress charts, all subject to numerous variations and manipulations, will be found to have value in aiding in clear thinking and in conveying ideas to employees or co-operating managerial divisions. Both mathematical and non-mathematical charts have their uses. Comparisons of wages from shop to shop, from firm to firm, from time to time, may be advantageously graphed, as may accident rates, measures of labor turnover, absence records, tardiness reports, trends or changes in these conditions, and numerous other aspects of regular personnel procedures. The many types of charts and the wide applications of graphic representation to personnel procedure are not inclusively described here, but numerous specific uses for various charts and graphs will be apparent as particular aspects of personnel control are described in later chapters.²

¹ Hayford, F. Leslie, "Some Uses of Statistics in Executive Control," *Journal of the American Statistical Association*, March, 1936, Vol. 31, No. 193, p. 35f; Yoder, Dale, "The Place of Statistical Analysis in Modern Personnel Administration," *Personnel*, May, 1936, Vol. 12, No. 4, pp. 247-251.

² For suggestions as to possible uses of graphic methods, see, Karsten, Karl G., *Charts and Graphs*, New York, Prentice-Hall, Inc., 1935; Riggleman, John R., *Graphic Methods for Presenting Business Statistics*, New York, McGraw-Hill Book Company, Inc., 1936; Arkin, H., and Colton, R. R., *Graphs, How to Make and Use Them*, New York, Harper & Brothers, 1936.

Distribution and series. Much statistical data reflecting personnel conditions may be most effectively presented in the form of distributions or series, of which the two most common types are frequency distributions and time series. In the former, data are arranged in the order of their size or magnitude to show the frequency with which each size appears in the whole distribution. Thus, the wages of employees may be tabulated in the form of a frequency distribution as follows:

<i>Wage Class Limits</i>		<i>Wage</i>	<i>Number of Workers</i>
<i>(L₁)</i>	<i>(L₂)</i>	<i>(Measure or Midpoint)</i>	<i>(Frequency)</i>
		<i>(m)</i>	<i>(f)</i>
1.50	2.50—	2.00	10
2.50	3.50—	3.00	40
3.50	4.50—	4.00	60
4.50	5.50—	5.00	40
5.50	6.50—	6.00	10

In the other most commonly used type of distribution, the time series, data are arranged to show changes that take place or have taken place over a period of time. Thus the changes that have featured the number on the payroll from month to month in a small firm might appear as:

<i>Month</i>	<i>Number on the Payroll</i>
January.....	65
February.....	87
March.....	94
April.....	110
May.....	99
June.....	112
July.....	110
August.....	75
September.....	66
October.....	58
November.....	94
December.....	54

It is frequently convenient to represent these two types of distributions graphically. In such cases, it is customary to record what is regarded as the independent variable or series on the X -axis or horizontal scale and to measure the dependent variable or series on the Y -axis or vertical scale. The terms "independent" and "dependent" are not regarded as absolute, but rather represent relative characteristics of the series, or they may be determined by the purposes of the

analysis. Thus, in the frequency distribution, the size or magnitude is generally assumed to be independent, and the number of cases, the frequency, is described as dependent and charted on the *Y*-axis. A rectangular chart or histogram of the frequency distribution mentioned in preceding paragraphs and illustrative of these principles is shown in

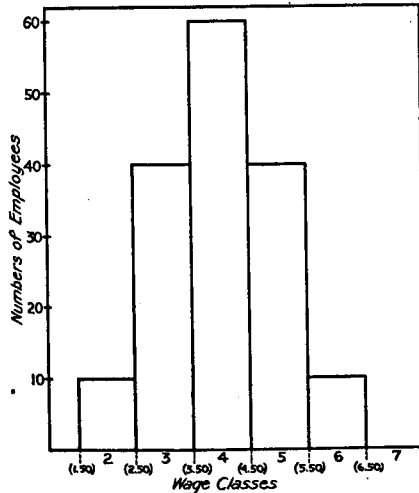


Fig. 1.—Simple Representation of a Wage Distribution: Rectangular Frequency Chart or Histogram. (Data: see page 60.)

Figure 1. Another effective method of representing data of this kind is the frequency polygon, which is illustrated in Figure 2. The data are the same as those of Figure 1. Histograms and polygons are useful in presenting many aspects of personnel data, as is suggested by the material in subsequent chapters.

In charting time series, it is customary to use a simple bivariate chart, with time represented as the independent

variable on the *X*-axis, and the other series measured on the *Y*-axis. In Figure 3, the data summarized in a preceding paragraph and representing changes in numbers on the payroll for the months of a year have been used to illustrate the common practice. There is no particular justification for connecting the points marking individual months with lines

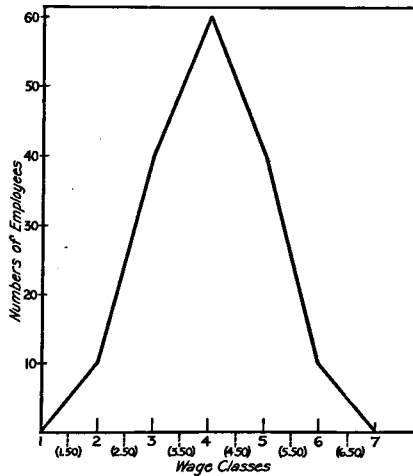


Fig. 2.—Alternative Representation of a Wage Distribution: Frequency Polygon. (Data: same as Fig. 1.)

beyond the fact that the lines assist in suggesting the general nature of change throughout the series.

Arithmetic scales such as those illustrated do not readily facilitate comparisons of changes in proportions or in rates of change. For that purpose, data may be expressed as percentages, or they may be portrayed by ratio charts, in which one scale is arithmetic while the other is logarithmic. The same result may be attained by plotting the logarithms of individual items, instead of the items themselves, on an

ordinary arithmetic scale. The use of the ratio or semi-logarithmic scale is illustrated in Figure 4, in which changes in hourly wages during recent years for several occupations are compared. Another use of the ratio scale is illustrated in Figure 29, page 338.

Classification, grouping, and tabulation. In many instances, data representing various group aspects of personnel problems and procedures cannot conveniently be used or

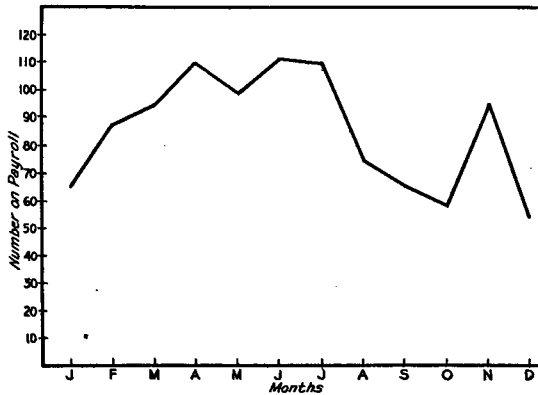


Fig. 3.—Changes in Monthly Employment: Simple Time Series Chart. (Data: see page 60.)

analyzed in their original form but must be classified or thrown into the form of a frequency distribution. Thus wages, as has been suggested, may be classified as from \$3 to \$4, from \$4 to \$5, from \$5 to \$6, or in some similar manner. So classified, their implications as a whole are much more readily recognized, and, at the same time, more complicated manipulations are facilitated.

The process of classification consists essentially of dividing the entire range of the data, that is, its extent from minimum to maximum, into classes or class intervals (symbol i).

Generally, data are first arranged in the form of an array, from lowest to highest. Essential rules governing the designation of classes may be briefly summarized as follows:

1. Intervals should be so selected that class marks or midpoints (symbol m) fairly and accurately describe the classes they represent.

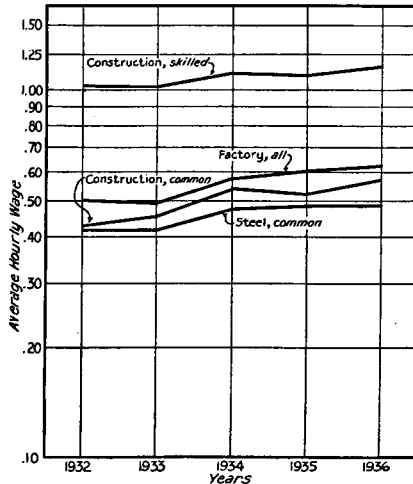


Fig. 4.—Comparative Proportionate Changes in Wages: Use of the Ratio Scale. (Data: *Survey of Current Business*, continuing series.)

2. The midpoints or class marks should be convenient for manipulation, so that long decimal fractions are to be avoided if possible.
3. Classes should be mutually exclusive.
4. Class limits should be adjacent to each other, so that no items fall between classes.

These last two features are generally attained by describ-

ing each class as representing items up to but not including the lower limit of the next class. For example, wages might be classified in intervals of dollars, and one class might include all wages from \$2 up to but not including \$3, the next from \$3 up to but not including \$4, and so on. Sometimes these limits are described in terms of a decimal fraction sufficiently extended so that no item can possibly fall between contiguous limits, as \$2.00 to \$2.99, \$3.00 to \$3.99, and so on. Again, the upper limit may be followed by a minus sign.

The result of such classification with its description of class intervals is the grouping and tabulation of data, and items so arranged are described as tabulated items. Tabu-

EXAMPLE 1

THE FREQUENCY TABLE

Data: Assumed for purposes of illustration.

I. DATA TO BE TABULATED

Workman	Daily Wage	Workman	Daily Wage	Workman	Daily Wage
a	\$2.50	j	\$1.75	s	\$4.00
b	2.75	k	2.25	t	5.00
c	3.00	l	2.00	u	5.25
d	5.00	m	6.25	v	5.15
e	6.00	n	6.00	w	3.85
f	4.75	o	3.75	x	5.00
g	5.25	p	3.25	y	4.00
h	3.75	q	4.00		
i	3.25	r	4.25		

II. TABULATED DATA

Column 1 Class Limits		Column 2 Class Marks	Column 3 Frequencies
L_1	L_2	m	f
\$1.50	\$2.49	2	3
2.50	3.49	3	5
3.50	4.49	4	7
4.50	5.49	5	7
5.50	6.49	6	3

lation of this sort provides what is called a *frequency table*.

The process of tabulation may be simply illustrated by reference to the data presented in Example 1. The data represent the wages of twenty-five workmen. In part I of the example, these data are listed as individual items; in part II they have been classified in a frequency table, with a class interval of 1. There, Column 1 describes classes in terms of their limits, while midpoints or class marks are noted in Column 2. In Column 3, the frequencies of each class are noted.

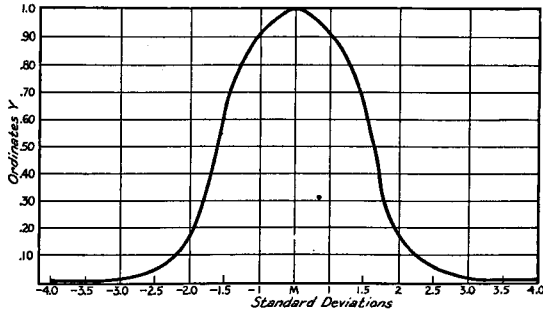


Fig. 5.—Distinctive Characteristic of a Normal Distribution.

The normal distribution. A frequency distribution that is of special interest in many types of statistical analyses is that known as the normal distribution. It represents the theoretical distribution of a large number of items according to the laws of chance, that is, it pictures the frequencies at various magnitudes or sizes that would appear if large numbers of items were selected by chance from any universe, and it actually represents the composition of many significant universes or populations, such as the intelligence rankings of large numbers of people, the measured production of vast numbers of workers, and numerous other similar phenomena. The general characteristics of such a distribution

X:981.73

68

will be apparent from the chart of a normal distribution pictured in Figure 5. The outstanding and distinctive feature of the distribution and the curve representing it is the symmetry of the two sloping sides, although there is an added important characteristic in the fact that neither of the two extremes declines to zero.

From the standpoint of personnel analysis, the major significance of the normal distribution curve is twofold: (1) when personnel data tend to approximate this distribution they may frequently be assumed to have been fairly selected, for the curve represents the range and difference of human variability; and (2) the curve, representing as it does the distribution of probability, is extremely useful in determining the reliability and significance of numerous measures of personnel performance and discovering whether or not such measures are likely to be merely chance occurrences or represent, on the contrary, the distinct results of determinable causes. More will be said on this point in subsequent paragraphs.

Measures of central tendency. Probably the most frequently used of any statistical device, as far as personnel procedure is concerned, is that which permits description of central or prevailing tendencies in a group and which most frequently involves the ordinary average or arithmetic mean. There are other measures of this sort that are of sufficient importance to justify attention here, including especially the median, the quartiles and percentiles, and possibly the mode, but the most used of all these measures is the simple average.

Little need be said as to the meaning of the term. The arithmetic mean is the number which, if substituted for each of the items, would provide the same total as theirs. It is the number which, if subtracted from each of the items in the series, will result in a group of remainders or deviations from the average whose sum is zero. It represents a measure of the typical or the summary character of the whole group. It is influenced, in its size, by each item in

the series, and it can be mathematically and exactly determined.

Students generally have little difficulty in calculating the average in untabulated data as the sum of all items divided by the number of items. Difficulty is increased, however, when data are tabulated. Possibly, this condition arises primarily from the fact that practice, in such cases, generally makes use of short-cut procedures that somewhat obscure the simple underlying nature of the process. Two convenient methods of averaging tabulated data are illustrated in Example 2, where the wages tabulated in Example 1 have been averaged. In the first part of the example, the average is found directly. In this case, the method of calculating the arithmetic mean (symbol M) is not essentially different from that used with untabulated data. In part II of the illustration, procedure is varied by the introduction of an arbitrary origin and manipulation in class interval units. The arbitrary origin (symbol R) is generally selected as the midpoint or class mark of the central class, although there are occasions when some other class, possibly that having the greatest frequency, may be preferable. It should be understood that the mark of any class, from beginning to end, can be taken as the arbitrary origin. All other class marks are then compared with the arbitrary origin and their deviations from it are noted in a column provided for that purpose. The arithmetic mean is calculated as

$$M = R + \left(\frac{\sum fd}{n} \times i \right),$$

where R is the assumed origin, fd is the product of frequencies in each class and the deviation of that class from the arbitrary origin, n is the total number of items, and i is the class interval.³

³It will be noticed that only the lower class limits are noted in Example 2. In actual practice, it is obvious that this notation is adequate, since it is understood that each class extends completely up to the next higher interval. Indeed, the class limits may be completely dispensed with if care is taken to prevent confusion in the designation of class marks or midpoints.

EXAMPLE 2

THE ARITHMETIC MEAN IN TABULATED DATA

Data: Wages, see Example 1.

I. DIRECT METHOD

Class Limits L_1	Class Marks m	Frequencies f	mf
1.5	2	3	6
2.5	3	5	15
3.5	4	7	28
4.5	5	7	35
5.5	6	3	18
		$\Sigma = 25$	$\Sigma = 102$

$$M = \frac{\Sigma mf}{n} = \frac{102}{25} = 4.08$$

II. INDIRECT METHOD

Assumed origin, $R = 5$.

Class Limits L_1	Class Marks m	Deviations from Assumed Origin (In Class Interval Units) d	Frequencies f	fd
1.5	2	-3	3	-9
2.5	3	-2	5	-10
3.5	4	-1	7	-7
4.5	5	0	7	0
5.5	6	+1	3	3
				$\Sigma = -23$

$$M = R + \frac{\Sigma fd}{n} = 5 - \left[\frac{-23}{25} \times 1 \right] = 5 - .92 = 4.08$$

This latter method is of particular significance in personnel analysis, because it represents a distinctly shortened procedure for cases in which large numbers of items are involved.

Averages of position. It is frequently desirable to discover items of representative position in an array. Thus, interest may be directed at what is the central item or median (symbol Md), when all items are arrayed in the order of their magnitude. Similarly, it may be desired to discover what value approximates the dividing line between the lowest one-fourth (the first quartile) and the remainder of all items so arrayed, or interest may center upon the division between the highest one-fourth (the fourth quartile) and the remainder of the distribution. Again, it may be desired to determine the limits of the upper ten per cent of the distribution, the lower limit of which is the 90th percentile. All these measures, the median, the quartiles, and the percentiles, are measures of position in the entire distribution, and the method of their calculation is sufficiently similar so that it can be considered as representing a single problem.

Clearly, in untabulated data, all these measures may be determined by counting. The median is the middle item in the array, or if the total number of items is even, it is the average of the two central items. More accurately, it is space $n/2$, if each item is thought of as separated by a single space. The quartiles may be located in precisely the same manner, as medians of the two halves of the distribution. Percentiles may be discovered by dividing the distribution into tenths, or, if necessary, into hundredths, for that purpose.⁴

In tabulated data, the process is slightly more complicated. It may be conveniently illustrated, however, by reference to the data of Example 3, and the procedure involved in estimating the median will serve to explain that involved in the measurement of other position averages (quartiles

⁴In practice, if it is desired to discover the percentile rank of items in a series which is not tabulated, 100 may be divided by the number of items, and each item may be assigned a percentile rank at the midpoint of its class. They are, of course, first arrayed.

Thus, if the items 7, 12, 27, 36, and 48 are involved, there are five classes, bounded by the 20th, 40th, 60th, 80th, and 100th percentiles. The percentile ranks would be, therefore, 10, 30, 50, 70, and 90.

and percentiles). Essential steps in the manipulations may be summarized as follows:

(1) The class in which the position average is located must be identified. In Example 3, for instance, the median position is the space, $n/2 = 12\frac{1}{2}$, and that space occurs in the class defined by limits of \$3.50 and \$4.49.

(2) A means must be found for estimating the position of the desired measure within the class. For the median, the position is defined by subtracting the lower cumulative of the class (Σ_1) from the indicated space, $n/2$, and expressing the remainder, divided by the frequencies in the class, as a fraction of the class interval.

(3) The value thus determined is added to the lower limit of the class to provide the desired measure. In formula form, the process appears as follows:

$$Md = \left[\frac{\frac{n}{2} - \Sigma_1}{f} \right] \times i + L_1,$$

where n is the total number of items in the distribution, Σ_1 is the lower cumulative of the class in which the median occurs, f is the frequency of that class, i is the class interval, and L_1 is the lower limit of the median class.

Any percentile may be measured by the same general process, for the median may be regarded as percentile P_{50} , and the quartiles are percentiles P_{25} and P_{75} respectively. The general formula for locating percentiles may be stated as follows:

$$P_x = \left[\frac{\frac{xn}{100} - \Sigma_1}{f} \right] \times i + L_1,$$

where P refers to the measure, x indicates what percentile is sought, Σ_1 is the sum of items up to the beginning of the percentile class, f is the frequency of the percentile class, i is the class interval, and L_1 is the lower limit of the percentile class.

Use of this formula for the median and for percentiles and quartiles is illustrated in Example 3, and further reference to the use of these measures will be found in the chapter on sources of employees.

EXAMPLE 3

MEDIAN, QUARTILES, AND PERCENTILES

Data: Assumed for purposes of illustration.

Class Limits		Frequencies <i>f</i>	Cumulatives	
<i>L</i> ₁	<i>L</i> ₂		Σ_1	Σ_2
1.50	2.50—	3	0	3
2.50	3.50—	5	3	8
3.50	4.50—	7	8	15
4.50	5.50—	7	15	22
5.50	6.50—	3	22	25
Total		25		

$$Md = \frac{\frac{n}{2} - \Sigma_1}{f} i + L_1 = \left(\frac{12.5 - 8}{7} \times 1 \right) + 3.50 = .6429 + 3.50 = 4.1429$$

$$Px = \frac{\frac{xn}{100} - \Sigma_1}{f} i + L_1$$

$$P_{30} = \frac{\frac{50n}{100} - 8}{7} \times 1 - 3.50 = \left(\frac{12.5 - 8}{7} \times 1 \right) + 3.50 = 4.143$$

$$P_{75} = \frac{\frac{75n}{100} - 15}{7} = \frac{75 \times 25}{100} - 15 \times 1 + 4.50 = \left(\frac{18.75 - 15}{7} \times 1 \right) + 4.50 = .5357 + 4.50 = 5.0357$$

The mode. Reference is often made, in analysis of frequency distributions, to the mode, which is the value that appears most commonly in an array, assuming a sufficient number of items to provide a fairly smooth distribution. In dealing with extensive personnel data, the mode may generally be most conveniently determined by graphing the distribution and reading the mode from the graph. When, however, it is desired to calculate the mode directly, the pro-

cedure outlined in Example 4 may be followed. A tabulation is first set up in the same manner as that employed in previous computations. The modal class is then determined. In this example, either of two classes might be selected since the two largest classes have the same number of items in each. With the lower limit of the modal class as a starting point, an increment whose size is determined by the size (frequencies) of adjacent classes is added. This device tends to approximate the shape of the curve of distribution at the modal point. Differences between the modal frequency and those of adjacent classes are balanced, as indicated in Example 4, and the weight thus determined multiplied by the class interval represents the increment to be added to the lower limit of the modal class. The result is always an approximation, and its limitations in this respect should be clearly recognized.

EXAMPLE 4
ESTIMATING THE MODE

Data: Assumed for purposes of illustration.

Class Limits		Frequencies <i>f</i>
<i>L</i> ₁	<i>L</i> ₂	
1.50	2.50—	3
2.50	3.50—	5
3.50	4.50—	7
4.50	5.50—	7
5.50	6.50—	3

Modal Class: Either 3.50-4.50 or 4.50-5.50 (since each includes 7 items). Assume it to be the first of these.

$d_1 = 7 - 5 = 2$, the difference between the frequency of the modal class and that of the preceding class.

$d_2 = 7 - 7 = 0$, the difference between the frequency of the modal class and that of the following class.

$$Mo = \frac{d_1}{d_1 + d_2} i + L_1 = \frac{2}{2 + 0} i + 3.50 = 1 + 3.50 = 4.50$$

Measures of dispersion. Another type of measure frequently utilized in analysis of personnel data is that which is

concerned with the scatter or spread about an average. Such measures are useful, for instance, in determining how truly representative average wages, average hours of work, or average production may be, and how general and extensive is the variation from that average. Most frequently used of these measures of variability, as far as the problems of personnel are concerned, are the standard deviation and quartile deviation.

Standard deviation (symbol σ). The standard deviation is particularly useful in connection with the personnel data because of its significance in so-called normal distributions, for many of the series that require attention approximate the normal and are therefore subject to the rules that apply to normal distributions. Also, the standard deviation, because of the manner in which it is calculated, facilitates comparison of the dispersion in several series that are measurable in quite different units, as, for instance, comparisons of distributions of wages with those of units of production, or hours of employment, or numbers of absences. Its convenience in such comparisons is largely responsible for its wide usage in connection with personnel data.

In distributions approximating the normal, the standard deviation measures a predictable area about the mean. Within the range of one standard deviation on both sides of the mean, for instance, there is included approximately 68½ per cent of all items in the distribution, and two such standard deviations on each side of the mean include some 95½ per cent of all cases, while three standard deviations account for 99½ per cent of the total distribution. This relationship of the standard deviation to the normal distribution has been graphically shown in Figure 5. Where data are known to approximate or to represent a sample of a normal distribution, recognition of this significance of the standard deviation is frequently of importance in evaluating the reliability of samples and in permitting further manipulation and analysis which will be described in subsequent chapters.

The standard deviation is calculated as the square root of the *variance*, where the latter is the quotient obtained by dividing the summed squares of deviations by the number of items. In formula form, the standard deviation is

$$\sigma = \sqrt{\frac{\Sigma f(d^2)}{n}}.$$

Calculation of the standard deviation in untabulated data may be described briefly as follows: The mean is first discovered. Then the deviations from the mean are listed and each is squared. These squares are totaled, divided by the number of items in the distribution, and the square root of this quotient is taken. The latter is the standard deviation of the series.

The process of calculating the standard deviation in tabulated data is somewhat more involved. Several procedures are available, but that illustrated in Example 5 will be found quite convenient where numbers of items are large. Its essential steps may be briefly summarized as follows:

- (1) Data are set up in a form similar to that used in estimating the mean.
- (2) An assumed or arbitrary origin (symbol R) is selected, generally the midpoint of the largest or central class, and deviations, plus and minus, from that class are noted in the appropriate column (d).
- (3) These deviations are multiplied by the frequencies of their respective classes. Their total is designated Σfd .
- (4) The deviations are squared and multiplied by their frequencies, and the resulting total, Σfd^2 , is noted.
- (5) The *variance*, which is the square of the standard deviation, is first found by simple formula from these values, as shown in Example 5, after which its square root may be taken as the standard deviation.

Standard and probable errors. Reference is frequently made to the standard error or the probable error. For all practical purposes, in personnel usage, the standard error

EXAMPLE 5

THE STANDARD DEVIATION

Data: Assumed for purposes of illustration.

Assumed origin, $R = 5$

Class Limits	Class Mark	Frequencies	Deviations		
L_1	m	f	d	fd	fd^2
1.50	2	3	-3	-9	27
2.50	3	5	-2	-10	20
3.50	4	7	-1	-7	7
4.50	5 = R	7	0	0	0
5.50	6	3	+1	+3	3
Totals		25		-23	57

$$V \text{ (the variance)} = \left[\frac{\sum fd^2}{n} - \left(\frac{\sum fd}{n} \right)^2 \right] \times i = \left[\frac{57}{25} - \left(\frac{-23}{25} \right)^2 \right] \times i =$$

$$[2.28 - (-.92^2)] \times i = 1.4336$$

$$\sigma = \sqrt{V} = \sqrt{1.4336} = 1.197$$

may be regarded as the standard deviation. The probable error refers to that fraction of the standard deviation, 0.6745, within which 50 per cent of all subsequent measures will fall by chance.

Quartile deviation. Another, somewhat less frequently used measure of dispersion is that which indicates quartile deviation. It measures one half the difference between the first and third quartiles.

Coefficients of dispersion. All these measures of dispersion may be and sometimes are referred to as fractions of some other measure of their distributions. So considered, the ratios thus created are known as coefficients of the particular measures. Thus the coefficient of standard deviation is the ratio of the standard deviation to the mean of the distribution, and the coefficient of quartile deviation is the ratio of that measure to the median.

Index numbers. Many types of personnel data may be more conveniently stated in relative than in absolute terms. Thus, measures of current wages, hours, industrial disputes,

and other similar data are frequently more meaningful when they describe current conditions as ratios of some base period. In other cases, it is desired to picture composite changes, such as those in living costs or those in which wages of several different types of workers are regarded as a whole. In such instances, more complicated types of index numbers or relatives are almost essential.

The simplest form of index number merely selects some item or group of items as a base and expresses all other items as ratios of that base. The base may be selected because it is believed to be representative or normal, or it may be selected because it is desired to use that period as a starting point or basis for judgment with respect to preceding or subsequent changes. Thus, if daily working hours in several successive periods were 10, 8, 6, 7, and 8 hours, respectively, they might be established as relatives of the first period, in which case the indexes would be 100, 80, 60, 70, and 80. Or the third period might be taken as a base, in which case the relatives would be: $\frac{10}{6} = 166.6$; $\frac{8}{6} = 133.3$; $\frac{6}{6} = 100$; $\frac{7}{6} = 116.6$; and $\frac{8}{6} = 133.3$. Again, the average of the first three years $(10 + 8 + 6) \div 3 = 8$ might be used as a base, in the same manner.

Simple relatives of this sort may be extremely useful in many situations, but even greater dependence is placed upon composite index numbers, in which changes in several series are combined. Cost of living indexes, for example, may combine changes in rents, food prices, clothing prices, and several other important constituent elements in a representative budget. In such cases, a major problem involves the appropriate weighting of such elements. The construction of these index numbers and their use is given further attention in the discussion of wage policy in a later chapter. There, also, means of changing bases, linking indexes, and deflating such measures are described.

Time series analysis. Another group of statistical tools that may be useful in connection with certain types of personnel problems involves what is generally described as

time series analysis. It seeks to analyze data representing changes that take place over a more or less extended time period to discover and measure trends, typical seasonal fluctuations, and possible cyclical movements. Since an outstanding illustration of the use of these techniques is to be found in connection with analysis to determine causes and types of instability in employment, detailed consideration of the most useful of these techniques is postponed until that discussion is undertaken in Chapter XVIII.

Correlation. Probably no statistical techniques will be found to have more varied applications in personnel analysis and control than those by means of which correlation is measured and evaluated. Frequently, the measure of correlation in itself may be highly valuable as suggesting the closeness of association among conditions regarded as significant from the personnel standpoint. Thus the relationship between scores on an admission test and later performance may be highly important as indicating the worth of the test as a selective device. Again, the correlation of performance with education, with school grades, age, or length of service may provide a basis for comparing the relative significance of these qualifications. In many cases, correlation analysis is utilized as a basis for prediction. If, for instance, the correlation between admission test scores and subsequent performance has been measured and found to be high and positive, then it may be worth while to estimate performance for a given individual from his test score. Sometimes, several factors may be jointly correlated in order to provide a basis for more accurate prediction.

In what is probably the most frequent use of correlation, the device is employed to suggest whether or not a suspected or known relationship is genuinely significant or merely accidental. The measure of correlation thus indicates whether it is worth while to undertake more extensive analysis of the possible relationship.

Conclusion. In numerous phases of personnel problems, as the latter appear from the viewpoint of management, sta-

tistical tools are essential to satisfactory analysis. The simple tools that have been described in this chapter, as well as many of the more involved devices to be mentioned in later chapters, will be found useful in numerous situations. It should be clearly understood that they are not applicable merely to the materials in terms of which they may be described, but that, as is suggested by the problems in various chapters, they have a wide range of applicability throughout the whole field of industrial relations.

Exercises

1. From recent issues of *Survey of Current Business*, discover the hours of work per week in factories for the last fifteen months and chart the data on an arithmetic scale. Chart the same data on semi-logarithmic paper.
2. Describe the most important characteristics of the normal distribution.
3. Calculate the average weekly wage from the following summary:

<i>Worker</i>	<i>Weekly Wage</i>
1	\$20
2	22
3	26
4	29
5	30
6	31
7	32
8	33
9	40
10	42

4. What is the median wage for the data of exercise 3?
5. Measure average monthly earnings from the following classification and frequency distribution:

<i>Monthly Earnings</i>	<i>Number of Workers</i>
\$ 50—\$ 75	20
75—100	80
100—125	120
125—150	100
150—175	70
175—200	30

6. What is the median of monthly earnings indicated by the data of exercise 5?
7. Prepare a histogram, and discover the modal wage indicated by the data of exercise 5.

Simple Statistical Tools

8. For the data of exercise 5, measure the quartile, Q_3 , and percentile P_{90} .

9. Prepare frequency polygons and measure the standard deviations for the data of exercise 3 and exercise 5.

10. What are the coefficients of standard deviation for the data of each of the above exercises?

11. The following tabulation classifies wage earners according to weekly earnings. Analyze it to discover the average wage, the median wage, the mode, and the standard deviation.

<i>Weekly Earnings</i>	<i>Number of Employees</i>
\$ 9—\$11	2
11— 13	5
13— 15	6
15— 17	4
17— 19	2
19— 21	1

12. Analyze the production records of employees tabulated herewith to discover the mean of production, the median, the standard deviation, and the limits of the first and third quartiles.

<i>Units Produced (m)</i>	<i>Number of Employees (f)</i>
28	1
30	7
32	11
34	9
36	6
38	4
40	2

13. Prepare a frequency distribution from the following data, which represent actual daily earnings of a number of employees compensated

<i>Earnings</i>	<i>Earnings</i>	<i>Earnings</i>	<i>Earnings</i>
\$2.05	\$3.35 (4)	\$4.40 (4)	\$5.45 (2)
2.10	3.40 (4)	4.45 (10)	5.50 (10)
2.15	3.45 (4)	4.50 (8)	5.55 (2)
2.25	3.50 (6)	4.55 (4)	5.60 (4)
2.35	3.55 (6)	4.60 (4)	5.65 (2)
2.40	3.60 (2)	4.65 (6)	5.70 (4)
2.45	3.65 (4)	4.70 (4)	5.75 (4)
2.50	3.70 (2)	4.75 (10)	5.80 (6)
2.60 (2)	3.75 (6)	4.80 (6)	5.90 (4)
2.70 (2)	3.80 (2)	4.85 (6)	6.00 (12)
2.75	3.85 (6)	4.90 (6)	6.10 (4)
2.80 (3)	3.90 (2)	4.95 (4)	6.20 (2)
2.85 (2)	3.95 (4)	5.00 (12)	6.25 (6)
2.90 (2)	4.00 (8)	5.05 (2)	6.35 (2)
3.00 (2)	4.05 (8)	5.10 (8)	6.45 (2)
3.05 (2)	4.10 (4)	5.15 (2)	6.55 (4)
3.10 (4)	4.15 (4)	5.20 (4)	6.75 (4)
3.15 (4)	4.20 (4)	5.25 (4)	6.95 (4)
3.20 (4)	4.25 (10)	5.30 (4)	
3.25 (4)	4.30 (6)	5.35 (2)	
3.30 (4)	4.35 (4)	5.40 (4)	

on piece rates. Construct a chart representing the distribution, and calculate the mean, median, 25th and 75th percentiles, the mode, and the standard deviation. (The small numbers in parentheses indicate the number of workers receiving that wage. Where no such indication appears, only one worker is involved.)

Collateral Reading

(Statistical tools described in this chapter are more extensively considered in each of the texts listed below.)

- Arkin, Herbert, and Colton, Raymond R., *An Outline of Statistical Methods*. New York: Barnes & Noble, Inc., 1934.
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- Mills, Frederick C., *Statistical Methods Applied to Economics and Business*. New York: Henry Holt & Company, Inc., 1924.
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- Riggleman, John R., *Graphic Methods for Presenting Business Statistics*. New York: McGraw-Hill Book Company, Inc., 1936.
- Riggleman, John R., and Frisbee, I. N., *Business Statistics*. New York: McGraw-Hill Book Company, Inc., 1932.
- Smith, James G., *Elementary Statistics*. New York: Henry Holt & Company, Inc., 1934.

CHAPTER V

Job Analysis, Description, and Classification

THE first step in any extensive personnel program and likewise the almost essential foundation therefor is a survey of labor needs, a careful determination of the types of positions and workers to fill them that are required to carry on the business. A majority of all the wide range of personnel functions requires such a preliminary analysis. It is necessary if appropriate sources of workers are to be made available; and it is equally important as a basis for selection, training, rating, remuneration, transfer and promotion, employment stabilization, and numerous other highly important personnel functions. Before any of these operations can be critically evaluated, it is necessary to know what jobs are to be done, what types of workers and personal abilities are required, and how these are related to each other.

The job description. The idea of preparing a description of each job throughout a whole organization as a basis for appropriate selection and placement is, of course, not a new one. Some sort of job description indicating the general nature of the work to be done must exist in the mind of every employment manager when he hires an employee. But the more definite conception of job specifications, or carefully prepared, well-arranged, detailed summaries of all the major characteristics of various positions, is of more recent origin. The activities of the war-time army Committee on the Classification of Personnel appear to be responsible for the general use of the term and for its present connotation, although the idea is inherent in F. W. Taylor's early discussions of scientific management. The term also features the Gilbreths' early emphasis on motion study, which aimed

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at an analysis of the physical movements involved in the performance of a job.

Today, if a job be defined as the "group of duties, respon-

UNITED STATES DEPARTMENT OF LABOR
UNITED STATES EMPLOYMENT SERVICE
OCCUPATIONAL CHARACTERISTICS CHECK LIST

1. Job title _____ 2. Date _____
 3. Establishment No. _____ 5. Industry _____
 4. Branch _____ 7. Department _____

Indicate the MINIMUM amount of each characteristic demanded of the worker in order to do the job satisfactorily by putting an X in column A, B, or C.

The amounts designated by A, B, and C are as follows:
 A. A very great amount of the characteristic, such as would be possessed by not more than two out of a hundred persons.
 B. A distinctly above average amount of the trait, such as would be possessed by the highest 30 percent of the population but less than the amount designated by A.
 C. An amount of the trait less than that possessed by the highest 50 percent of the population.

In checking these items, think of people in general, not just persons on the job.
 If some characteristic is demanded which does not appear in this list, write it in and check as described above.

Amount of Characteristic			Characteristic Demanded of Worker	Amount of Characteristic			Characteristic Demanded of Worker
C	B	A		C	B	A	
			1. Work rapidly for long periods.				24. Memory for oral direction.
			2. Strength of hands.				25. Memory for written direction.
			3. Strength of arms.				26. Artistic conception.
			4. Strength of back.				27. Intelligence.
			5. Strength of legs.				28. Adaptability.
			6. Dexterity of fingers.				29. Ability to make decisions.
			7. Dexterity of hands and arms.				30. Ability to plan.
			8. Dexterity of feet and legs.				31. Initiative.
			9. Eye-hand coordination.				32. Understanding of mechanical devices.
			10. Foot-hand-eye coordination.				33. Attention to many items.
			11. Separating of independent movements of left hand.				34. Oral expression.
			12. Estimate size of objects.				35. Skill in written expression.
			13. Estimate quantity of objects.				36. That is flexible with people.
			14. Perceive form of objects.				37. Memory of names and persons.
			15. Estimate speed of moving objects.				38. Personal appearance.
			16. Memory of values.				39. Communication (written direction).
			17. Memory of length.				40. Emotional stability.
			18. Sense of smell.				41. Work under hazardous conditions.
			19. Sense of taste.				42. _____
			20. Vision discrimination.				43. _____
			21. "Blindfold" discrimination.				44. _____
			22. Memory for details (things).				
			23. Memory for lines (patterns).				

Definitions for added characteristics _____ U.S. GOVERNMENT PRINTING OFFICE 16-2222

O. S. P. 22a-22

Fig. 6.—Occupational Characteristics Check List. (Source: United States Employment Service.)

sibilities, and activities assigned to an individual," as Tead and Metcalf have described it, then a *job description* may be defined as a careful summary of the most important features of the job in terms of its general nature and of the type of

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operative required to perform it in an efficient manner. Where a distinction is made between such a job description and a *job specification*, the latter is regarded as a more de-

UNITED STATES DEPARTMENT OF LABOR UNITED STATES EMPLOYMENT SERVICE					
1. Job title		2. Date			
3. Alternate job title		4. Establishment No.			
5. Industry		6. Branch		7. Department	
A. MINIMUM QUALIFICATIONS FOR EMPLOYMENT:					
1. Sex	2. Age	3. Height	4. Weight		
5. Education: S R W English Other (1) Specify					
6. Special knowledge required: (a) None (1) Specify					
7. Experience: (a) None (1) Same job (2) Reasonable (3) RMP					
and (b) Similar job (3) Reasonable (4) RMP					
or (c) Similar job (4) Title (5) Reasonable (6) RMP					
(a) Other job (6) Title (7) Reasonable (8) RMP					
8. Comments:					
B. RELATION OF THIS JOB TO OTHER JOBS.					
1. From what jobs are workers promoted to this job?					
2. To what jobs (not involving promotion or demotion) may workers on this job be transferred?					
3. To what jobs are workers on this job promoted?					
4. How does this job fit in with other establishments?					
5. With what jobs in this job combined in other establishments?					
6. Comments:					
C. DETAILS OF JOB.					
1. Seasonality of job: (a) Not seasonal (2) Seasonal periods					
(3) Done by others					
2. Machines used: (a) Done by worker					
(b) Done by others					
3. Personal tools and equipment required: (a) None (1) Specify					
4. Accuracy required: (a) Coarse (1) Fine (2) Exact					
5. Knowledge of special measuring devices: (a) No (2) Name and use					
(3) Name and use					
6. Average production:					
7. Comments:					
8. Comments:					
9. Comments:					
10. Comments:					
11. Comments:					
12. Comments:					
13. Comments:					
14. Comments:					
15. Comments:					
16. Comments:					
17. Comments:					
18. Comments:					
19. Comments:					
20. Comments:					
21. Comments:					
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94. Comments:					
95. Comments:					
96. Comments:					
97. Comments:					
98. Comments:					
99. Comments:					
100. Comments:					

Fig. 7a.—Job Specification Form. (Source: United States Employment Service.)

tailed and more carefully organized description of all important features of the job. It is the result of attentive and minute study, whereas job descriptions are most commonly prepared by a relatively cursory survey.

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Both were developed by the United States Employment Service for use in its nation-wide program to provide job specifications for major industries. The latter is somewhat more detailed than may be necessary for a particular business, where certain common characteristics of all jobs are known to management and do not require formal enumeration. The essential controlling factor, as far as the detail to which specifications are carried is concerned, is the use that is to be made of these analyses.

Job classification. Frequently, in modern business, job descriptions are made the basis for a comprehensive classification of all positions in the business concern, a classification that seeks to divide jobs into groups according to the degree of responsibility, education, experience, initiative, and other important characteristics required to perform the functions involved. Such a classification may be desired as a basis for wage and salary payments, for promotional purposes, or for facilitating managerial understanding of the special problems of particular departments, where, for instance, responsibilities may be disproportionately great. In any case, such a job classification must be preceded by careful job analysis and detailed description of the positions involved.¹

Job analysis. Basic to both job description and job classification is, of course, the discovery of essential and distinctive features of each job, that is, job analysis. The purposes of job analysis have been suggested in preceding paragraphs. Such analysis furnishes the essential information from which job descriptions or job specifications may be prepared and upon which job classifications may be based. It determines the characteristics of all jobs, thus suggesting personnel requirements, and is, therefore, a preliminary step in personnel analysis and control. It lays the basis for intelligent selection, for determining the need for and nature of training programs,² for judging the propriety of physical conditions sur-

¹ See Bergen, Garret L., "The Uses of Job Study," *Personnel*, November, 1929, Vol. 6, No. 3, pp. 85-100.

² See, Doll, Edgar D., "Job Analysis as a Basis for Teaching," *Bulletin of the Taylor Society*, June, 1929, Vol. 14, No. 3, pp. 134-141.

rounding the job, and for adjusting wages to workers' contributions, for it makes possible the setting of standards of performance on each job at the same time that it permits comparisons of duties and responsibilities among various positions. In this way it facilitates promotions and transfers by making possible more accurate comparisons of jobs. It permits improved performance at work by facilitating the appropriate placement of employees and by suggesting improved methods of performing the operations involved. It allocates responsibility throughout the organization by defining the duties of each position and the interrelationships among positions.

Job analysis has social as well as commercial values. It effectively defines labor needs in specific terms and thus provides knowledge essential to intelligent vocational guidance and vocational training. At the same time, if its resulting job descriptions are brought together, it assists in the accurate determination of opportunities for various types of workers in the industries and localities for which such information is available. By its analysis of performance on the part of the individual worker, job analysis suggests improved techniques, with the result that increases in efficient performances accrue, in considerable measure, to the advantage of the worker, so that his earnings are multiplied. At the same time, the aggregate effect of such improvements is more efficient production, a result that permits generally higher living scales throughout society.

There are many types of job analysis, ranging from the discovery of only the most obvious features of the job to detailed studies of each motion involved and each significant physical, mental, and social characteristic of the satisfactory worker. In some cases, effort is made to measure quantitatively the personal characteristics required, as a basis for comparative ratings to be applied to each job.⁸ In larger organizations, where no individual can know all positions

⁸See, "Recent Developments in the Field of Time and Motion Study," *Taylor Society Bulletin*, September, 1935, p. 196ff.

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personally, it is necessary to provide considerably more detail than is essential in smaller firms or in a business where there is considerable similarity in all positions and in their personnel requirements. Naturally, the detail provided by job analysis is reflected in the job specification or description.

Content of the job specification. In general, the data collected by job analysis and recorded in job descriptions relate to the two essential features of each position, (1) the nature of the work involved, and (2) the type of worker that appears best fitted for the position. With respect to the nature of the job, the items most frequently included in the resultant job specification are indicated in Figures 7a and 7b and include:

1. The job title.
2. The classification number, if any.
3. A general description of the job.
4. A summary statement as to tools, machinery, and special equipment involved in the work, including a statement as to whether the machine is a general purpose or a special purpose instrument.
5. The usual position of the worker, whether standing, sitting, or walking about.
6. A description of material used.
7. A statement as to the relationship of the job to those with which it is most closely associated, that is, its position in the production sequence.
8. A notation as to jobs from which workers are promoted and others to which the operators may be promoted from this job.
9. Training required and usual methods of providing such training, including union requirements as to apprenticeship and the length of time ordinarily required to train operatives.
10. Amounts and types of compensation.
11. Usual working hours.

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12. Peculiar conditions of employment, including unusual circumstances as to heat or cold, humidity, light, ventilation, or any others. The description may contain a statement with respect to standards of performance, and this feature will undoubtedly be included if job analysis has involved time and motion study. Where such studies have been made, the specification will describe in detail the motions involved in the operation, the range of timing required for each such motion, and standards of performance for the job as a whole. Measurements of fatigue may also be available, in which case such data may well be included in the specification.

With respect to the worker, the data generally available from the job specification include:

1. Notations as to sex and preferred races and ages.
2. Special physical characteristics, such as size or weight, strength required in back, arms, or legs (types to avoid may also be noted).
3. Special physical dexterities required, such as finger dexterity, ambidexterity, and the like.
4. Special emotional characteristics required, such as disposition, mood, general attitude, introversion or extroversion.
5. Special mental abilities required, such as intelligence (may be defined in terms of percentile ranks based on tests), abstract reasoning ability, learning speed, and sensory abilities, including sight, smell, hearing, touch, and so on.
6. Special cultural characteristics required, such as education, familiarity with languages, knowledge of sciences or arts.
7. Requirements as to experience and skill (may be defined in terms of test scores).
8. Special characteristics not included in the ordinary classification.

Job analysis procedure. The method of making job analyses necessarily differs according to the purpose for

DIEMAHER
PUNCH FINISHER

AUTOMOBILE INDUSTRY

TOOL AND STANDARDS DEPARTMENT

Summary of Duties

Smooths and finishes surface of punch dies for use in presses; works under direct supervision of GROUP LEADER.

Work Performed

1. Prepares castings of die for machining:
 - a. Smooths sides of castings by filing and rubbing.
 - b. Fits and fastens castings together.
2. Finishes punch die:
 - a. Uses air hammer, files, scraper, grinding wheel, and rubbing stone to smooth sides and contact surfaces of oversize machined punch die.
 - b. Paints rim die and inserts punch die in it. Removes punch die, thus marking high spots on the sides of the punch die.
3. Paints template and places die or punch thereon, thus transferring paint to high spots on the contact surface.
4. Removes high spots by scraping, grinding, and rubbing.
5. Tests smoothness by rubbing hands over surface.

Detection of roughness on the surface by touch, and accurate fitting of punch die to template and rim die, require the most skill.

Punch and Rim Dies: Consist of a set of two upper Toggle-Press dies, fitting one inside the other, which operate in the following sequence: The outer or rim die descends, stamping and holding the edges of the sheet metal; the punch die descends and stamps the center.

Template: A master sample of the finished stamping to which the dies are fitted.

Tools

Air hammer; files; scraper; grinding wheels; rubbing stone.

Material

Castings for upper, lower, and punch dies; dies that have been machined to rough size and shape.

General Qualifications for Employment

Education: Eighth grade.

Experience: 2 to 5 years as DIEMAHER or DIEMAHER'S APPRENTICE.

Special sensory acuteness: Touch to determine smoothness of surfaces.

Special knowledge: Ability to read blueprints and layouts.

Working Conditions

Surroundings: Inside; noisy, dirty.

Hazards: Injuries to eyes from flying particles.

Relation to Other Jobs

Promotion from: DIEMAHER'S APPRENTICE.

Job breakdown: DIEMAHER; PUNCH FINISHER.

Fig. 8a.—Published Job Specification. (Source: *Job Specifications in the Automobile Industry*, Vol. II, pp. 369-371. Washington: United States Employment Service, 1936.)

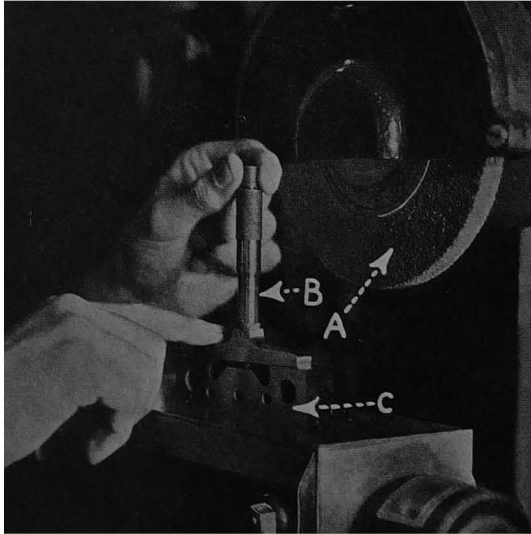


Fig. 8b.—Illustrative Photograph for Published Job Specification. (A, grinding wheel; B, micrometer; C, die.)

which they are intended and the size and nature of the business. Thus, a large concern may employ special job analysts to make a comprehensive and continuing study of all its positions, while a smaller organization may have to depend upon less frequent attacks on the problem, undertaken by those whose activities include many other tasks. Only the most common procedures can, for this reason, be described.

Unless job analyses are to be made by specialists employed for that specific purpose, the usual first step is the formulation of a questionnaire. Such a questionnaire may be used

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by a limited group engaged in the job study, or it may be more generally distributed among employees, with the request that the latter use it in preparing statements describing their jobs. If workers are asked to provide such information, it must then be revised by foremen or others of the supervisory force whose perspective makes the inter-relationship and comparability of various jobs apparent, and, in any case, the questionnaires filled out by individual employees can be regarded as only a preliminary statement. In some cases, a committee representing each division or department can effectively revise and supplement the information thus provided; in others, the revision will be accomplished by the department charged with responsibility for the job analyses.

When data thus secured have been edited and revised, they may be summarized in a simple descriptive statement or they may be reorganized and recorded upon special job specification forms. Choice as to which method is to be used will depend primarily upon the purposes for which the study is intended and the size of the organization. In larger firms, jobs may be classified as a result of these analyses, and an extensive job classification, with positions carefully evaluated according to characteristics regarded as definitive, may be set up.

Such a classification may be expected to disclose two significant characteristics of the business organization. It may show that numerous jobs, distinguished by their titles, have little or no other distinction. They are the same, although different designations have come to be applied to them. At the same time, it may be found that the same title may be used to describe quite different jobs. A secretary, for instance, may not be the same in two departments, as far as actual work is concerned.

From the careful analysis of these job descriptions emerges the *job classification* or *occupational index*, in which standard titles accurately designate positions throughout the whole organization.

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Management may find it worth while to examine the published job descriptions prepared by the Occupational Research Program of the United States Employment Service. There are now one or more volumes of job descriptions for each major industry studied. The descriptions frequently include photographs of the machines used, as is illustrated in Figures 8a and 8b.⁴

Time and motion study. For some types of operations, the job descriptions may be profitably supplemented by time and motion studies. Where work is repetitive, where the job requires a regular sequence of motions, studies of the motions involved may suggest the most effective manner of performance at the same time that they facilitate the setting of definite standards of performance on the job. Obviously, where the job consists of a variety of individual tasks varying from hour to hour and from day to day, motion study is not appropriate.

Motion study has been described as the simplest form of job study. It consists of the discovery and description of individual motions involved in the performance of a given operation. Ordinarily, motion study is supplemented by time study, in which the motions thus defined are studied to determine how much time each element requires, that is, what portion of the total time expended on the job is attributable to each of the constituent motions. In ordinary mechanical operations, the job is first carefully divided into a sequence of performances or motions, after which observers note the time expended by different operatives upon each of these portions of the whole (see Figure 9). There are several different systems or methods of timing. In one, the observer times the job as a whole, noting the time consumed in each part of the performance, and this over-all or continuous timing is repeated until a fair sample of usual performance is obtained. In another, the observer notes the

⁴See *Job Specifications for the Automobile Industry, etc.*, U.S. Employment Service, 1936; Koepke, Charles A., *A Job Analysis of Manufacturing Plants in Minnesota*, Minneapolis, Employment Stabilization Research Institute, 1934.

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⁴See *Job Specifications for the Automobile Industry, etc.*, U.S. Employment Service, 1936; Koepke, Charles A., *A Job Analysis of Manufacturing Plants in Minnesota*, Minneapolis, Employment Stabilization Research Institute, 1934.

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cases, ordinary photographs or simple sketches may be used to assist in providing a clear picture of the operations involved in the job. A time study form is illustrated in Figures 9a and 9b.

When a job has been subjected to time and motion study, it is customary to set a "standard" or "task" time, useful principally in providing a basis for remuneration. Most common procedure in setting such a standard first compares the results of a number of individual time studies to determine what appears to be the most representative time for proper performance. Generally, it is necessary to ignore unusually rapid or unusually slow performances and to select the median or modal time among those regarded as truly representative. The resulting allocation is known as "selected operating time." It is necessary, in setting standard or task time, to make numerous allowances in addition to the selected operating time. Thus, allowance must be made for personal needs, for rest and relaxation to overcome natural fatigue. Allowance is also necessary for machine attention, both in preparation for the day's work and for lubrication and necessary adjustment. In many types of business, additional allowance may be necessary for machine delay, that is, interference with constant operation attributable entirely to causes beyond the control of the operative. The amounts of such allowances will necessarily vary with different operations, but they ordinarily add from 15 to 30 per cent to the selected operating time.

Time study thus frequently includes considerably more than the mere timing of motions. Securing a proper measurement of selected operating time requires a careful study of the time expended upon the operation together with carefully determined allowances for inclusion in the standard or task time assigned to the operation. Moreover, it is

Applied to Time and Motion Study, New York, McGraw-Hill Book Company, Inc., 1932; Gilbreth, Lillian, "Motion Study," *Society for the Advancement of Management Journal*, July, 1936, Vol. 1, No. 4, pp. 106-107; Barnes, Ralph M., *Time and Motion Study*. New York, John Wiley & Sons, Inc., 1937.

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not enough merely to have established such standards, for the conditions entering into them are subject to such constant change in many types of business that new studies must be undertaken and new standards set up at frequent intervals.

Recently, a variation of the usual form of time study has appeared. Instead of timing only repetitive and routine operations, it analyzes the time devoted to various types of work by employees who perform a wide range of duties. Thus, time studies are made of the work of retail clerks, bank employees, and others whose jobs involve several different types of work, and these studies seek to discover what proportions of the working day or week are devoted to each of these varied duties. It may be desired to know, for instance, how much time is devoted to sales as contrasted with that given to preparation of the stock, ordering, bookkeeping, and other necessary activities.

Workers' attitudes. Much misunderstanding has arisen in the minds of employees with respect to the purposes of job analysis, especially that which includes time and motion study. They have frequently felt that such managerial activities were inimical to their interests, that time studies represented a slur upon workers' honesty in that they implied a failure on the part of the worker to do his best, and that the whole procedure was calculated to "get as much out of" the worker as possible, without reference to the latter's personal interests or physical welfare. Many employees associate time study with the speed-up, a process of getting them to do more without an adequate increase in compensation. There is probably ample evidence in the early use of time and motion study to support labor's contentions along these lines. Unscrupulous "efficiency experts" have frequently shown little consideration for the interests of employees in their efforts to make a showing for their contributions to productive efficiency. They have ignored, in many cases, necessary allowances for physical comfort and good health, and they have set standards that required te-

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dious, painful performance, beyond reasonable justification. Moreover, because unionization has sought constantly to set its own standards of performance and compensation, and because these standards have frequently conflicted with those determined upon as a result of time studies, the whole movement early acquired the reputation of being opposed to labor organization and the objectives of the latter.

Under these circumstances, it is highly important that any program of job analysis be intelligently interpreted to employees before it is undertaken. Workers must be shown that they as well as management are to gain from improved performance and fairer compensation made possible by job analysis. Their active coöperation is an essential element in the success of the job analysis program, and the benefits of the latter are easily erased if a feeling of opposition, distrust, and general discontent is engendered by the undertaking.

The necessity for labor's coöperation has become more obvious with the increasingly militant spirit of organized labor in recent years. It is probable that job analysis and classification should be undertaken jointly, if they are to be most successful. As Dickinson has indicated, the troublesome aspects in recent years have not been technical but rather political and psychological, and the only way to overcome them is to secure joint sponsorship for the job analysis program.⁶

Job rating and job classification. In many firms and throughout the various divisions of the federal and many state governments, job analysis has been made the basis for job rating, and ratings thus secured have been compared and organized to provide a classified service or system of job classification. Essentially, the process consists of defining a group of duties and responsibilities believed to be present in greater or lesser degree in all or in each of several groups of positions, after which these features are weighted accord-

⁶Dickinson, Z. C., *Compensating Industrial Effort*, p. 215. New York: Ronald Press Company, 1937.

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ing to their importance in each position. By totaling the weights thus established, it is possible to compare positions, and this comparison is made the basis for a system of job classification. The classification is then utilized as a basis of salary and wage control throughout the entire organization, and it provides, at the same time, a basis for determining appropriate promotions and transfers.

The process of job classification logically begins with careful study of job descriptions, possibly supplemented by questionnaires to determine from each worker what duties or responsibilities of his position he regards as most important. The amount of time spent on each of these duties is also noted, together with the degree of supervision or initiative involved in the job and its requirements in terms of special technical knowledge or skill. Job specifications and supplementary questionnaires may be reviewed and supplemented by comments from department heads.

Usually, classification of the various positions begins by establishing a dual basis for such classification. From one point of view operations are classified according to the kind of work they involve. This is a *functional* classification, and it would distinguish, for instance, administrators, clerks, secretaries, engineers, accountants, salesmen, and other types of employees, on the basis of the function they perform. A second basis of classification is the *grade* of work involved within each functional division. This grade represents a comparison of the importance of each job within a functional class with all the other jobs in that class. Thus, the position described as "clerk, first class," presumably involves greater responsibility or skill than that of the same general classification but "second class."

In practice, the elementary steps in setting up a classified system generally involve the distinction of the most obvious functional classes. Jobs are first allocated to each of these major classes. Then, by more careful study of the available data with respect to each job, each of these classes is further divided, and additional classes appear as the process of sub-

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division continues. Jobs may be given specific titles in accordance with the classification thus developed, and then levels of importance within each type of work may be defined. Thus, it may be found possible to discern several levels of secretarial efficiency and worth, and the same may be true of performance in a given type of industrial operation.

It will have become apparent, as the classification proceeds, that there are certain fairly clearly defined factors in each job which determine the class into which it falls. These factors will vary from one business to another but those which are most commonly encountered include, as representative: ⁷

1. The complexity and difficulty of duties.
2. The amount of routine and repetition as contrasted with variety.
3. The breadth or scope of duties.
4. Amount of supervisory responsibility.
5. Personal contact with the public.
6. Educational requirements.
7. Experiential requirements.
8. Necessary individual initiative.
9. Responsibility for business policy.
10. Responsibility for property.

As these definitive characteristics appear, jobs may be checked against them in an effort to test the accuracy of preliminary classification. In some types of organization, particularly banking institutions, a fairly well-established procedure has emerged, in which department and administrative heads are asked to rate each position under their supervision according to the degree in which it involves each of a group of features so arranged. Then, by securing a consensus of opinion as to the relative significance to be

⁷See, "Classification of Office Jobs," Metropolitan Life Insurance Company, New York, 1931; Baruch, Ismar, "The Administration of a classification plan through periodic audits," Chicago, Civil Service Assembly, 1936.

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attached to each of these factors throughout the organization as a whole, the relative weights of each position are readily determined. They provide a consistent check on the classification system. Thus the comparative importance of two positions might appear in summary form as shown in Table I.

TABLE I
RATINGS ACCORDED TWO POSITIONS BY THE WEIGHTED FACTOR METHOD

Factor or Feature	Position 1			Position 2		
	Rating for Organization as a Whole	Relative Weight	Product	Rating for Organization as a Whole	Relative Weight	Product
Complexity of duties	9	10	90	2	10	20
Initiative required...	9	12	108	1	12	12
Responsibility for policy.....	8	20	80	0	20	0
Responsibility for property.....	6	16	96	3	16	48
Personal contacts...	9	16	144	0	16	0
Educational requirements.....	8	12	96	5	12	60
Experiential requirements.....	10	14	140	0	14	14
		100			100	
Position Rating			754			154

As will be noted in a later chapter, such a rating of individual positions provides a convenient basis for development of a rating system for individual employees in these positions.

An excellent example of such a classification is to be found in the system set up for the classified civil service of the United States by the Personnel Classification Board, now administered by the Civil Service Commission. Positions are classified as to function in five "services" including: the professional and scientific (symbol *P*); subprofessional (*SP*); clerical, administrative, and fiscal (*CAF*); custodial (*CU*); and clerical-mechanical (*CM*). Then,

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positions are further classified as to qualifications required in "grades." Grades are distinguished on the basis of "importance, difficulty, responsibility, and value of the work." Various services have varying numbers of grades. Nine such grades are included in the professional service; eight in the subprofessional service; sixteen in the clerical, administrative, and fiscal service; ten in the custodial service; and four in the clerical-mechanical service. Positions are further divided into classes, a class being described as "a group of positions sufficiently similar in respect to the duties and responsibilities thereof that the same requirements as to education, experience, knowledge, and ability are demanded of incumbents, the same tests of fitness are used to choose qualified appointees, and the same schedule of compensation is made to apply with equity."

Upon the basis of this classification, uniform scales of compensation are enforced throughout the classified service.⁸

A word of caution is necessary in this connection. There is always a danger of too enthusiastic acceptance of any numerical or quantitative evaluation of either positions or workers. Such a quantitative measurement is so convenient that it is easy to overlook even its most obvious shortcomings in the desire to apply such a system. It must always be remembered that any such classification necessarily involves errors of judgment as well as arbitrary decisions upon questions that inevitably arise, and management should realize the necessity for frequent revaluations. Moreover, duties and responsibilities of various positions are subject to change, so that what may represent a reasonably satisfactory classification at one time may shortly come to involve serious inaccuracies. Changes in machines, whether they occur in the shop or in the accounting room, may effect significant changes in the duties of those who operate them. What is necessary is complete, up-to-date information on every job, together with regular, periodic rechecks on the

⁸ See, *Division Organization Manual*, United States Civil Service Commission, Vol. 1, 1936.

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values assigned to each of them. Moreover, it appears that the weighting procedure may not add greatly to the value of ratings, for, as Kingsbury has recently shown, there is a very high correlation between ratings on so-called "work factors" and ratings on "qualification factors" of the same positions.⁹

Organizational outline. When jobs have been carefully described, it is possible to set up a chart or outline showing the interrelationships among various positions throughout the organization as a whole, and more detailed outlines may be provided for each division or department. Charts of this kind may be found useful in providing an over-all picture of the whole and in checking comparative ratings and salary classes, as well as indicating possibilities for transfer and promotion.

Conclusion. Job analysis is the primary step and beginning function in a comprehensive program designed to maintain satisfactory industrial relations. It places responsibility throughout all phases of the productive organization at the same time that it critically evaluates personnel requirements from highest to lowest ranks of employees. It must be a highly objective process; no prejudice, preconception, or advance bias as to the worth of any position or employee has any place in it. At the same time, however, the process of job analysis must be carried on with a keen regard for the feelings, ambitions, and suspicions of employees, and it must have the coöperation and support of all department heads, supervisors, and foremen. The personnel of the entire organization must be convinced of the fact that ultimate results will be beneficial rather than detrimental, which means that the purposes, methods, and results deserve and require careful preliminary introduction and continued interpretation. If time and motion study are to be a part of the process, they should receive special mention and explanation, for many workmen have well-founded suspicions that

⁹See, Kingsbury, Forrest A., "Classification of Office Positions," *Personnel Journal*, August, 1933, Vol. 12, pp. 91-97.

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they frequently provide a basis for the speed-up. When management decides to change productive processes or wage rates as a result of job analysis, a detailed, frank explanation of proposed changes, in which management "lays its cards on the table" and explains all the facts with respect to costs, savings, and probable earnings and hears all considerations workers wish to advance, is essential to the maintenance of proper employee morale; and modern practice tends to make such decisions and changes a coöperative function in which representatives of workers have an active part. Only by such means can management reasonably expect to avoid workers' dissatisfaction, distrust, and sabotage in the new arrangements.

Exercises

1. Use the form illustrated in Figures 7a and 7b to prepare a job description for a position with which you are familiar.
2. Outline the procedure you would follow in developing a job rating system.
3. Prepare or secure a chart showing the interrelationships among positions in a large commercial or industrial establishment.

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CHAPTER VI

Sources of the Labor Supply

ONCE the labor needs of an organization are known, the obvious problem facing those charged with responsibility for personnel is the discovery of sources from which appropriate types of workers may be drawn. The problem may not be a simple one, especially if the labor requirements of the organization are diverse, for it is necessary not only to discover appropriate sources but to compare their value, that is, to determine which of them may be more satisfactory than others.

It should not be assumed, of course, that as a result of job analysis the whole working force is to be replaced. Rather, a careful study of jobs will probably disclose the fact that numerous positions are well filled, while others are not staffed with appropriate types of workers. As time passes, misfit appointees can be transferred and necessary additions to and replacements in the force more carefully selected. It is in filling such positions, in making necessary replacements, and in providing for expansion, that the problem of appropriate sources will appear. That problem, restated, is the discovery and comparison of sources of workers, to the end that employees who are properly qualified for the positions they are to fill may be quickly and economically found and made available for the selective processes to be described in the next two chapters.

In practice, the problem of sources really becomes two problems. The first consists of the discovery of supplies of workers of various types. The second, and probably the more important, involves the establishment and development of means whereby these sources may be compared and

evaluated to determine which of them is productive of the most satisfactory employees of each type to be employed. The first of these problems requires, in many cases, extensive experimentation, together with reference to the experience of other similar concerns. The second necessitates critical evaluation of employees secured from various sources to determine which has been most satisfactory.

Inside sources. To a considerable extent, of course, positions may be filled by transfer from another job within the organization. Where such transfers involve increased responsibility and compensation, they are, in effect, promotions, and they generally exert a healthy effect upon the morale of the whole organization. Even where no promotion is involved, transfers make possible the more satisfactory placement of employees by permitting workers to function in positions for which they are naturally qualified, so that inside sources must be regarded as important and as justifying careful consideration. In a large organization, the success of appointments made by transfer should be carefully checked to facilitate the comparison of various departments as sources. It may be found, for instance, that one division of the organization appears to be providing excellent training for a wide variety of positions, whereas another division, because it is so specialized, or for some other reason, is much less satisfactory as a source.

Personal applications. In periods of prosperity, many firms find that the source from which they draw the largest number of new employees is what is generally described as "applicants at the gate," and in depression, dependence upon this source is encouraged by the fact that the number of workers making application is greatly increased, while new appointments are, generally speaking, reduced in number. This source may be, therefore, quite satisfactory, as far as certain types of employees are concerned, especially when there is widespread, general unemployment. As one employment manager has said, any kind of worker that might

be wanted could be selected any morning from the line waiting at the employment gate.

Common sense requires, however, that the success of employees so selected be checked against that of workers secured from other sources. The essential question is, are those culled from applicants at the gate as good as or better than employees secured from other sources, such as those to be described in later paragraphs of this chapter? The answer will probably vary from one department to another. For some divisions, applicants at the gate may prove entirely satisfactory, while for others they may be quite unsatisfactory. Constant watch will have to be kept over the results of these comparisons, for it is obvious that the qualifications of applicants may vary greatly as unemployment affects larger or smaller proportions of all workers. Moreover, there are certain types of positions that can seldom be filled from this source.

Present employees. Many organizations find that present employees are a valuable source of information as to potential workers. Such firms ask for the names of those who might be interested in employment, or in other cases, suggest that employees ask interested friends to make personal applications. It is well, however, to keep careful records of those so selected in order that they may be compared with employees secured from other sources. Too great dependence upon such sources is likely to encourage the development of cliques and inner circles among employees, but there is genuine value to be gained from the fact that workers thereby have a word in the selection of their colleagues.

Correspondence. Numerous applications are received by all large organizations by mail. While it is generally impossible to promise employment without a personal interview, mail applications frequently provide an introduction to desirable sources, and it may be well worth the effort to invite applicants who write in to appear personally at their convenience. Generally, unless prospects of employment appear unusually good, a firm would not be justified in ask-

ing such an enquirer to make a special trip to the city and should, rather, suggest an appointment at a time when the applicant comes there for other reasons. As with all other sources, it is important that employees so secured should be identified in personnel records in a manner that permits comparison with other sources.

Advertising for employees. Prior to the depression following 1929, it was customary for many large concerns to advertise extensively, indicating their need for workers. While the use of display advertising in newspapers, handbills, and upon billboards has generally been confined to periods when unemployment was at a minimum, there is almost constant use of classified advertisements to secure specialists of one type or another, and firms frequently allow the appearance in local newspapers of news stories calculated to encourage large numbers of applications.

All sorts of broadcast advertising are subject to serious criticism, for obvious reasons. Sudden recruitment of large numbers of workers does not ordinarily permit the careful selection that should prevail. Neither employee nor employer is likely to secure maximum long-time benefits from such procedure. Meanwhile, extensive advertising serves generally to bring to the plant many times the number of workers to be employed, so that the community may have to care for the surplus. Frequently, it is charged, employers have planned on such an over-supply as a means of enforcing wage reductions.

In general, advertisement of any sort is an admission on the part of management that its personnel policies are not clearly defined or effectively planned, for it should not be necessary to seek employees by any such hit-or-miss procedure. Moreover, the usual classified advertisement is likely to awaken resentment on the part of present employees if it is signed, for there will be many who feel that they should be advanced to the position it describes. If, on the other hand, it is a blind advertisement, many good workers will avoid answering it, lest it represent their present em-

ployers, who might resent the worker's willingness to consider a change.

Scouting. In times of labor scarcity, concerns have not infrequently resorted to the use of scouts who have traveled about, both within and without the borders of the nation, and encouraged workers to migrate. In the years before the expansion of the public employment service, when there were no satisfactory agencies for informing labor of its opportunities throughout the length and breadth of the nation, such scouts frequently performed a useful service in increasing the mobility of labor and bringing it to points where it could be most effectively utilized in the national economy. At the same time, however, it was widely charged that they frequently made exorbitant claims for the jobs they described and misled workers who could not, once they had moved, afford to return.

Scouting unquestionably played a large part in encouraging immigration into the nation, for the poorer classes in central and southern Europe as well as Mexico were readily interested in the positions described as awaiting them in this country. Prior to 1921, immigration legislation on the part of the United States enforced a mildly selective rather than a restriction policy, so that almost unlimited numbers were admissible. In several prewar years as many as a million immigrants were admitted in a single year, and a total of some thirty-seven million immigrants has been admitted to the nation.

Largely as a result of the continuing opposition to this policy and of the difficulties with so-called "hyphenated" Americans during the World War, Congress began, in 1921, the enactment of a series of immigration laws designed to restrict the flow of immigrants. The law of 1921 limited annual immigrants from designated "quota" nations to three per cent of the representatives of each such nation resident in this country as enumerated in the Census of 1910. In an effort further to restrict numbers and, at the same time, to encourage a larger proportion of all immigration from

northern and western European countries, the present act was passed in 1924. It was felt, at the time, that immigrants from northern and western European nations were more readily assimilated and fitted into the American social and political system, because earlier settlers of the nation had been representative of these nations. In the last two decades preceding the war, however, there had been increasing proportions of immigrants from southern Europe, and the tendency for such immigrants to increase was unmistakable. Accordingly, the Act of 1924 laid down a permanent plan, based upon a conception of "national origins," which proposed that immigrants be admitted in proportions similar to the national origins of the present population.

Such a program required a careful study of national origins. The act, therefore, described a long-time program, to be put into effect when study made the requisite facts available, and a short-time program to be used as a stop-gap while studies of national origins were in progress. Temporary provisions emphasized the encouragement of immigration from northern and western Europe by shifting the base from the Census of 1910 to that of 1890, a time at which extensive immigration from southern Europe was in its early stages. It further limited the total numbers to be admitted by reason of the fact that the population of the nation was distinctly smaller in 1890 than it was in 1910 and by the provision that quotas were to consist of two per cent instead of three per cent.

These provisions were to remain in effect until the president declared the national origins study sufficiently advanced to be utilized as a basis for the permanent program. It was intended that the study should be completed and national origin provisions made effective by July 1, 1927, and a committee charged with responsibility for determining national origins of the population of continental United States, as disclosed by the Census of 1920, was appointed in 1924. The committee found its task an extremely difficult one, and a satisfactory analysis of national origins was not avail-

able until 1929. President Hoover declared the permanent provisions effective on July 1st of that year.

According to the present law, a total of 150,000 immigrants is admissible from all quota nations. Each nation's quota is a percentage of this total equal to the percentage of the total population of continental United States (the total that may be ascribed to all quota nations) represented by persons of that national origin, according to the Census of 1920, except that the minimum quota for any quota nation is 100. Quota nations are carefully defined, and they exclude the independent nations of North, Central and South America (placing no quota limits on their citizens) and China and Japan (whose nationals are not eligible to citizenship and are, therefore, excluded).

As a result of these and other provisions of immigration legislation, scouting among the laborers of foreign nations has been effectively discouraged, and, except for some activity among Mexican laborers in the decade of the 1920's, it has ceased to be an important recruiting device. The general over-supply of labor since 1929 has, of course, made it unnecessary and unprofitable. At the same time, the greatly expanded activities of a nation-wide, coordinated public employment service since 1933 have made it equally unnecessary to scout workers in one locality for employment in another section of the nation.¹

Employment agencies. One of the most effective established sources of employees is, of course, the employment agency. Resort has long been had to such services, both private and public. In some cases, firms have dealt only with private agencies operated by individuals as business ventures. In others, they have, in cooperation with other firms in the same industry or the same locality, subsidized or operated an employment office for the mutual benefit of all sponsoring firms. For certain types of employees, such

¹ See, Carpenter, Niles, "The New Immigration Policy and the Labor Market," *Quarterly Journal of Economics*, August, 1931, Vol. 45, No. 4, pp. 720-723.

private agencies are a satisfactory source, although general dissatisfaction with such services, coupled with the vast unemployment characteristic of the years following 1929 and the extensive expansion of public services since 1933, has forced a large portion of all private agencies out of business.

Private, fee-charging agencies have received much criticism in recent years, chiefly because some such agencies have resorted to definitely unethical, racketeering practices. Fee-splitting with equally unscrupulous employers or foremen, misrepresentation of positions, exorbitant fees, and numerous other evidences of malpractice have characterized the activities of certain of these private agencies, so that expansion of the public free employment service, made almost essential by the vast public works program of the recovery period, met with considerable popular approval.

The present public employment service operates under provisions of what is generally known as the Wagner-Peyser Act of 1933. That legislation replaced the former federal employment service with a new United States Employment Service under the general direction of the Secretary of Labor. It is a sort of parent service and is charged with responsibility for (1) the direct control and operation of a temporary, emergency public employment service designated as the National Reemployment Service, and (2) coordination and general supervision of state public employment services in a permanent federal-state coöperative program.² In putting the emergency features of the program into effect, the National Reemployment Service provided offices that served all the three thousand counties in the nation, excepting the few already having such facilities, for the purpose of selecting employees to be used in the extensive public works programs of the recovery campaign.

The permanent program provides federal funds to be

² Yoder, Dale, "Reorganizing the Public Employment Service," *Bulletin of the Harvard Business School Alumni Association*, February, 1935, Vol. 11, No. 2, pp. 81-87.

used in matching state appropriations for employment exchanges, provided that these state services meet standards as to records, personnel, and related features imposed by the federal coordinating agency. States are required, in order to secure the matching funds, to enter into contracts in which they agree to preserve the specified standards. All the states and the District of Columbia have provided the necessary enabling legislation for participation in the cooperative program, and all but five of the state plans had been approved by the close of 1937. It is reasonable to expect, therefore, that all states will be included in the nation-wide system shortly. Arrangements require that local agencies make regular reports to state headquarters, and the latter are required to maintain an elaborate statistical and accounting division, so that labor needs and supplies in various sections of the nation may be constantly known and effectively coordinated.

The result is a vastly improved public service in many localities, a service whose personnel is for the most part intelligent, ambitious, and anxious to demonstrate its advantages. Moreover, the service becomes increasingly important as state unemployment laws are made effective, for it is one of the requirements of the federal Social Security Act that unemployment insurance benefits must be administered by public employment offices in states having such services. For these reasons, the public agencies are likely to provide an increasingly important source for many types of employees in the future.⁸

Schools and colleges. For certain types of employees, high schools, vocational schools, and colleges and universities are a natural and valuable source. Generally, however,

⁸See, Speck, Peter A., "The Work of European Labor Exchanges," *Monthly Labor Review*, December, 1928. Vol. 27, No. 6, pp. 1123-1135; *Administration of Public Employment Offices and Unemployment Insurance: Canada, France, Sweden, Switzerland*, New York, Industrial Relations Counselors, Inc., 1935; DeSchweinitz, Dorothea, *How Workers Find Jobs; A Study of Four Thousand Hosiery Workers in Philadelphia*, Philadelphia, University of Pennsylvania Press, 1932; Hoppock, Robert, "More Jobs in New York," *Occupations*, April, 1937, Vol. 15, No. 7, pp. 648-650.

there is a tendency on the part of employers to assume much more in the way of uniformity among graduates or students in such institutions than is justified by the facts. Actually, there is great variance among high school graduates, and the same is true of those of other educational institutions. This variation characterizes graduates of any particular institution, and it is equally notable in distinguishing different institutions, that is, different high schools or different colleges.

For this reason, it is important that employers discover what types of graduates they desire and how the institutions from which they come differ in designating such students. In many cases, students in one or another special course or high school curriculum or college sequence will be found especially desirable. Again, certain scholastic levels may be defined as minima if the levels of performance within individual institutions are known. It is, however, necessary to recognize differences in grading among institutions that may be presumed to be equal in standing. Some use letter grades, others numerical scores, and still others have more complicated measures of scholastic performance. Standards in each of these marking systems vary widely.⁴ Thus, whereas most students with average grades above *C* in one school may be quite satisfactory, in another it may be necessary to require somewhat higher minimum grades. As a matter of practice, it is highly important that personnel authorities maintain a close check on each individual source and upon the manner in which each such source grades its students, so that the selective program may be advanced by limitation of contacts to those who are known or reasonably believed to be of the type needed. In this direction, it will be found desirable to note carefully student records as to scholarship and extra-curricular activities, to check the general level of

⁴See, Dooley, C. R., Jones, A. M., and Dwinell, J. F., "What Does Industry Seek in College Graduates?" *Personnel*, February-May, 1932, Vol. 8, No. 3-4, pp. 85-96; Rees, R. I., Walters, J. E., Bradshaw, F. F., and McKnight, N. M., "The Supply of and Demand for College Graduates," *Personnel*, February-May, 1932, Vol. 8, No. 3-4, pp. 67-84.

grades in the several institutions from which employees are drawn, and thus to determine what grade levels appear to be related to successful performance and how each institution's grades may be reduced to a basis comparable with the grades from other similar sources.

In most cases, the use of percentile ranks to define scholastic attainment will facilitate comparisons. Whereas different high schools or colleges may have varying definitions of an *A* or *B*, if the members of graduating classes are given marks indicating percentile ranks in the class, various levels of scholarship are likely to be more clearly defined. It is for this reason that many firms now seek students who rank above the 50th, 75th, or 90th percentile, instead of asking for a *C*, *B*, or *A* grade average.

There are several methods by which percentile ranks may be assigned to grades or scores. In some cases, where institutions have collected and classified grades over a period of years, comprehensive analysis may have established percentile norms or standards, so that a given grade average is automatically assigned a percentile rank. In the same way, experience over a period of years and involving a large number of cases may have established equivalent percentile ranks for such measurements of ability as college aptitude tests. In such cases, scores are automatically translated into percentile ranks. Some high schools maintain similar standards in their grades. Sometimes, percentile ranks in high school performance are combined with aptitude test scores to provide college aptitude ratings, also expressed in terms of percentile rank.

For small numbers of items, a simple procedure will generally suffice in providing percentile ranks. It is first necessary to array the items from lowest to highest. If the number of items is relatively small and does not therefore justify their arrangement in the form of a frequency table, it is convenient to divide one hundred into as many equal intervals as there are items and to assign to each item a percentile

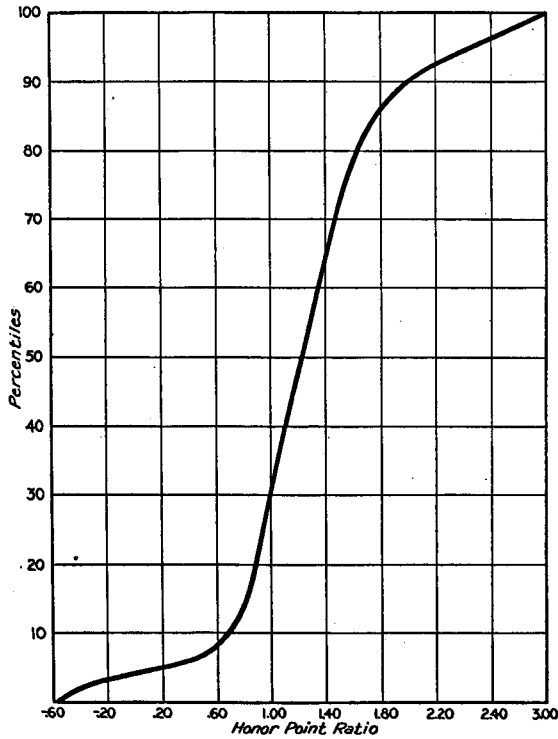


Fig. 10.—“Less Than” Cumulative Grade Curve for Locating Percentiles. (Data: Honor point ratios of 180 seniors, School of Business Administration, University of Minnesota, 1937.)

rank corresponding to the midpoint of the interval in which it falls. Thus, to illustrate, with only three items the classes would be 0-33.3, 33.3-66.7, and 66.7-100. The percentile

ranks would be 16.7, 50, and 83.3.⁵ With larger numbers of items, the percentiles are interpolated by a more involved process which has been described in Chapter IV.

If percentile ranks are to be assigned to all members of a class, it is generally convenient first to locate the most important percentiles, say the 10th, 20th, 30th, and so on, and then to graph the whole distribution in what is generally described as a "less than" cumulative chart or ogive, such as that illustrated in Figure 10. Such a chart displays, on one axis or scale, the grades or scores being distributed and, on the other, the percentages of the distribution that are less than each such grade. Once the major percentiles have been located on the chart, the intervening ranks may generally be determined merely by interpolating graphically between these points.⁶

Labor organizations. Where operations are undertaken on a closed-shop or preferential union-shop basis, the union or unions involved generally supply all needed employees. Little need be said as to this source, although it may be pointed out that unless much more care is given by some unions to their apprenticeship programs, it may become impossible to depend upon them for skilled operatives in the future.

The waiting list. Many managements find it well worth while to make a careful record of all applications and thus to build up a valuable file or waiting list. If such a file is properly indexed, it should provide a ready reference to persons qualified for each of the various types of positions to be filled. The effectiveness of such a waiting list depends primarily upon two factors: (1) the care with which individual applications are taken, analyzed, and filed; and (2) the general state of the labor market. If applications are in-

⁵This method assumes a linear distribution. If it is assumed that the distribution is normal in nature, a more complicated process would be necessary. The method described is essentially merely a convenient approximation for purposes of comparison.

⁶See, Drooge, H. V., "Arriving at a Labor Recruiting Policy through the Statistical Interpretation of Routine Employment Data," *Harvard Business Review*, October, 1933.

complete, hasty, and inconclusive, or if they are not filed according to the positions for which applicants are qualified, then the waiting list is likely to be practically worthless. Further, if times are good and there is little unemployment, the waiting list is not likely to prove to be extensive or inclusive. If, however, large numbers and types of workers are seeking employment, a well-indexed waiting list may prove to be the most valuable of all sources. An essential feature of any such file is the inclusion of former employees who have been released without prejudice.

Miscellaneous sources. There are many other sources and many other methods of discovering and recruiting employees that may be found useful under certain circumstances. In particular localities, fraternal organizations, lodges, and churches may serve as effective employment agencies. For certain types of employees, inquiries may be addressed to other business organizations or to former employees. Sometimes it is desired, as a matter of policy, to take a certain proportion of all employees from penal institutions. One of the large motor companies for instance, is said to secure one per cent of its workers from such sources. In special circumstances, concerns have sometimes resorted to actual house-to-house canvass, and other similarly unusual tactics may be found necessary.

Evaluating sources. The most important obligation of any personnel division or executive with respect to sources is not their discovery but their evaluation. It is not enough merely to discover what sources of employees are available. Rather, it is even more important to determine what sources are most valuable, where most satisfactory employees for each of the various positions to be filled are or have been obtained.

No single, simple method of evaluating sources will suffice. It is first necessary to establish some criterion by which to measure satisfactory performance on the job. Such a measure may be available in the quantity of work performed, especially if such performance is a matter of

record as a basis for piece-work wage payments. Again, such a measure may be available in a system of ratings of employees, where such ratings effectively measure the worth of the worker from the viewpoint of the employing organization.

Statistical measurements. When such a criterion is defined, sources may be compared simply by discovering average performance or average ratings for workers from various sources. Thus, a life insurance selling organization might compare agents secured from high schools with those secured from colleges as shown in Example 6, in which data have

EXAMPLE 6

COMPARISON BY SIMPLE AVERAGES

Data: Monthly sales of insurance (in thousands of dollars) by two groups of agents, one made up of those secured from colleges, the other of those secured from high schools.

Source: High School		Source: College and University	
Agent	Sales (in \$1000)	Agent	Sales (in \$1000)
A	1	A	5
B	4	B	7
C	6	C	1
D	5	D	2
E	2	E	1
F	8	F	3
G	10	G	9
H	1	H	12
I	2		
J	1		
		Total	40
Total	40	<i>M</i>	5
<i>M</i>	4		

been over-simplified to facilitate explanation of the principles involved. The sales of ten salesmen secured from high schools are compared with those of eight men secured from colleges and universities. From the example (and ignoring the obvious fact that no significant conclusion should be drawn from such limited data), it appears that the salesmen selected from the higher educational level are superior,

for the ten high school salesmen average but four thousand dollars per month, while the eight college men average five thousand dollars. It might be concluded, therefore, that universities and colleges represent a preferable source, other considerations being equal. A similar analysis might be applied to a variety of other sources, that is, performance might be compared for workers secured through employment agencies, scouting, advertising, recommendations from present employees, applicants at the gate, and others.

Such analysis is not, however, conclusive, even though data are extensive, unless differences between group averages are very large, for averages tend to hide individual variations, and they may be only partially representative of the group. They may, in other words, represent the summary rather than the typical character of the group. In comparing two averages, therefore, analysis must consider the possible range of variation in each of the averaged groups, for it is entirely possible that these ranges may be so large that the apparent distinction between the two averages represents accidental or chance variation. A simple statistical test may be applied to evaluate this likelihood. It is illustrated in Example 7, where the data of Example 6 are evaluated. The standard error of each of the means is first calculated, as shown, after which the standard error of their difference is discovered. If the actual difference between the two means is three or more times the standard error of the difference thus found, that fact may be taken as indicating the certainty that the averages represent distinctly different groups. If the ratio of actual difference to standard error of the difference is less than three, question may reasonably be raised as to their distinctive nature.

The use of averages is but one means of comparing different sources. Other, more extensive investigations may appear worth while. Correlation of various characteristics of employees secured from different sources with later performance or other measures of value may be effective. A variety of such comparisons is, of course, possible. Employees may

EXAMPLE 7

THE SIGNIFICANCE OF VARIATIONS IN AVERAGES

Data: Same as that of Example 6.⁷

Source: High School				Source: College and University			
Agent	Sales Y	d d=Y-M	d ²	Agent	Sales Y	d d=Y-M	d ²
A	1	-3	9	A	5	0	0
B	4	0	0	B	7	+2	4
C	6	+2	4	C	1	-4	16
D	5	+1	1	D	2	-3	9
E	2	-2	4	E	1	-4	16
F	8	+4	16	F	3	-2	4
G	10	+6	36	G	9	+4	16
H	1	-3	9	H	12	+7	49
I	2	-2	4				
J	1	-3	9				
Total	40		$\Sigma d_1^2 = 92$	Total	40		$\Sigma d_2^2 = 114$
M	4			M	5		

Standard deviations:

$$\sigma_1 = \sqrt{\frac{\Sigma d_1^2}{n_1}} = \sqrt{\frac{92}{10}} = \sqrt{9.2} = 3.033; \quad \sigma_2 = \sqrt{\frac{\Sigma d_2^2}{n_2}} = \sqrt{\frac{114}{8}} = \sqrt{14.25} = 3.775$$

Standard errors of the means:

$$\sigma_{M_1} = \frac{\sigma_1}{\sqrt{n_1 - 1}} = \frac{3.033}{\sqrt{9}} = \frac{3.033}{3} = 1.011; \quad \sigma_{M_2} = \frac{\sigma_2}{\sqrt{n_2 - 1}} = \frac{3.775}{\sqrt{7}} = \frac{3.775}{2.6458} = 1.4268$$

Standard error of the difference:

$$\sigma_D = \sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2} = \sqrt{1.011^2 + 1.4268^2} = \sqrt{1.02212 + 2.03576} = \sqrt{3.05788} = 1.7486$$

$$\text{Ratio of actual difference to } \sigma_D = \frac{1}{1.749} = .572$$

⁷The test of significant differences between means thus applied is unnecessarily conservative if the two series being compared are correlated, as is likely to be the case when performance of the same group of workers is compared under varying circumstances. In such instances, the formula may be corrected for this condition, in which case it appears as

$$\sigma_D = \sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2 - 2r\sigma_{M_1}\sigma_{M_2}}$$

where the r is the usual Pearsonian coefficient of correlation.

be classified according to labor turnover and accident rates, various measures of performance and rating, absenteeism

and tardiness, measures of morale such as contributions to suggestion systems, scores upon various tests, grades made in training school courses, wages earned, and numerous other evidences of the value of employees secured from each of them. The nature of the comparisons to be made will vary from business to business and will suggest themselves to the alert personnel executive as personnel problems arise and facilities for the measurement of workers' performance and value are made increasingly available in industry.

The application blank. One of the most universally used of personnel records or forms is the application blank, which may well be briefly discussed in connection with sources, since it so generally accompanies all initial contacts with potential employees. The blank used should be based upon the results of job analysis and should secure from the employee information relevant to the qualifications noted as significant upon job specifications. In general practice, it appears that all such characteristics from all departments are generally included in one all-inclusive application form, with a few additional items added for no particular reason. As a result, the blank frequently appears quite formidable and loses much in its usefulness. If distinctly different types of workers are to be employed, it would be well to provide different application forms, so that each would contain only the information to be utilized.

Most commonly included in such blanks are the following items: date; name; address; telephone number; date of birth (avoid direct statement of age); marital status, number of dependents (might frequently be omitted); religious preference (of doubtful significance and frequently a source of ill-will and erroneous conclusions as to managerial policy); citizenship; national or racial origin; social, economic, and fraternal affiliations and activities; employment record (indicating reasons for all changes); physical characteristics; references. Some blanks provide spaces for preliminary interviewer's ratings or remarks on what are regarded as especially significant characteristics.

APPLICATION FOR COLLEGE GRADUATE

IMPORTANT
Paste
Inexpensive
full face photo
here

Date _____ 19__

Name _____
Last First Middle

College Address _____
Street City State Phone

Home Address _____
Street City State Phone

EDUCATIONAL QUALIFICATIONS

Prep or High School attended _____ City _____ State _____ Age at graduation _____

College or University _____ Years Attended _____ Degree _____ Year _____

Major work _____ Scholastic standing _____

Prerequisites - Clubs - athletics - activities _____

How did you finance your education _____ When can you start if engaged _____

What languages other than English do you Speak, Read, Write _____ Fluently _____

LIST ANY POSITIONS YOU HAVE HELD DURING SCHOOL YEAR, VACATION OR OTHERWISE

DATE STARTED	DATE RESIGNED	EMPLOYER	ADDRESS	POSITION	REASON

PHYSICAL

Physical defects, if any - Sight _____ Do you wear glasses _____ Speech _____

Hearing _____ Limbs _____ Bodily deformities _____

Date of birth _____ Height _____ Weight _____ Married or Single _____

Nationality _____ Language _____ English - French - Italian - German, etc.

Fig. 11a.—Specialized Application Blank for College Students. (Courtesy of the Personnel Division, Goodyear Tire & Rubber Company.)

Many of these items might well be omitted in connection with certain positions, while, in others, additional items might be found valuable. In general, the application form should be limited and adapted to necessary personal characteristics determined from job specifications for the positions involved. Limitations thus imposed will increase the con-

OCCUPATIONAL PREFERENCE			
What phase of industrial work interests you most using the list below as a guide.			
<hr/>			
<hr/>			
<hr/>			
<hr/>			
<hr/>			
<hr/>			
<hr/>			
Advertising	EFFICIENCY	SQUADRON	ENGINEERING STAFF
Business Research	Office	Engineering	Construction
Credit	Production	Factory Office	Converter
Law	Sales	General Office	Electrical
Merchandise Distribution	Time Study	Production	Hoisting & Vent.
Patent	FOREIGN TRADE	Plant Sales	Maintenance
Packaging	Accounting	Wholesale Sales	Steam & Power
Publicity	Production	CHEMICAL	ENGINEERING
Rail Service	Sales	Chemical Engg.	Chemical
Tax & Insurance	PERSONNEL	Chemical Plant	Supervisor
Travel	Factory Labor	Work. Order Comptrol.	INSTRUCTOR
Treasury	Office	Research	Labor
ACCOUNTING & OPERATING	Sales	Tire Comptroling	Physical Ed.
Auditing	SHIPBUILDING	DESIGN & DEVELOPMENT	University
Branch Operating	Design	Machine	PRODUCTION
Cost Accounting	Operation	Work. Order	Control
General Accounting		Shop	Supervisor
Radio Accounting		Tool	
Store Operating			
REFERENCE (CHARACTER & ABILITY)			
NAME	CITY & STREET ADDRESS	BUSINESS OR PROFESSION	
<hr/>	<hr/>	<hr/>	
<hr/>	<hr/>	<hr/>	
<hr/>	<hr/>	<hr/>	
<small>NOTE: Read instructions mentioned on reverse attached application blank by the Director.</small>			
		Signed _____	Date _____
		Address _____	

Fig. 11b.—Specialized Application Blank for College Students (reverse).

venience for later examination and will facilitate filing procedure. The form should create, by its appearance, a favorable impression, for it is the first impression of the firm, in many cases, for many who are to become a part of the organization. Files of these blanks should be so keyed as to permit their regular and systematic revision, so that inactive

applications may be regularly removed. An excellent illustration of a specialized blank for a particular group of applicants is provided in the application blank for college students illustrated in Figures 11a and 11b.

Conclusion. Sources of new employees are almost as varied as are the types of business seeking to contact these sources. Appropriate and desirable sources vary with different types of positions, localities, varying economic conditions, and numerous other factors. What is of fundamental importance is that different sources be carefully compared, that careful records of the results obtained from each source be maintained, and that comparisons of these results and checks upon each of them be regularly undertaken. Sources that are found to be excellent for one type of worker will frequently not be productive of the type of employee desired for other positions, and sources that are found quite satisfactory at one time may be much less so at another. Qualities of high school graduates vary, for instance, from high school to high school and from year to year, and a similar variation characterizes other sources. It is for this reason that constant analysis, constant comparison, constant checking are primary requisites to the determination of satisfactory sources.

Exercises and Problems

1. Summarize, in outline form, the variety of sources from which employees may be obtained.
2. Describe changes in immigration legislation and their effects on labor scouting.
3. How does the present system of public employment services differ from earlier public offices in this country.
4. Prepare a brief of one of the articles and studies mentioned in footnotes in this chapter.
5. The S Company, a banking chain, has been filling the ranks of its clerical staff by selection from the "upper ten per cent" of graduating classes from several high schools. All such applicants are given the company's admission test and their scores are recorded, whether or not the candidates are employed. The following summary represents test scores of applicants from two high schools in a single year.

Sources of the Labor Supply

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<i>High School No. 1</i>		<i>High School No. 2</i>	
<i>Student</i>	<i>Score</i>	<i>Student</i>	<i>Score</i>
A	75	A	98
B	55	B	96
C	45	C	87
D	65	D	83
E	40	E	74
F	80	F	73
G	85	G	75
H	70	H	65
I	95	I	50
J	90	J	55
K	35	K	45
L	25	L	35
M	30	M	85
N	10	N	82
O	100	O	87
		P	100
		Q	43
		R	53
		S	60
		T	84

- (a) What is the average grade of students from each school?
 (b) What is the median grade in each group?

6. You are given the following performance records of two groups of workers, one made up of employees secured from the public employment service (Source 1) and the other secured from private agencies (Source 2).

<i>Employees from Source 1</i>		<i>Employees from Source 2</i>	
<i>Performance Scores in Units</i>	<i>Numbers</i>	<i>Performance Scores in Units</i>	<i>Numbers</i>
80 to 90*	5	75 to 85*	3
90 to 100	10	85 to 95	7
100 to 110	15	95 to 105	10
110 to 120	20	105 to 115	15
120 to 130	30	115 to 125	25
130 to 140	10	125 to 135	25
140 to 150	10	135 to 145	20
		145 to 155	15

*Upper class limit means up to but not including the given figure.

To discover:

- (a) The mean of scores for Source 1.
 (b) The mean of scores for Source 2.
 (c) Standard deviation of each series.
 (d) Standard errors of the two means.
 (e) Standard error of the difference of the two means.
 (f) Ratio of actual difference to this σ_D .
 (g) Median of each series.
 (h) P_{50} for each series.

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7. Calculate the standard error of the mean for the data of exercise 3, Chapter IV.

8. Calculate the standard error of the mean for the data of exercise 5, Chapter IV.

Collateral Reading

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CHAPTER VII

Selection

PROBABLY no single aspect of the personnel functions in modern industry has received more extensive attention from students of personnel problems than that involving satisfactory selection of employees. Attention has been directed at many phases of selection—at testing, at interviewing, at the setting of personnel standards, and at such important subordinate functions as placement, vocational guidance, and the follow-up that is essential if a constant check upon the efficacy of selective techniques is to be available.

Each of these phases of selection may deserve a word of definition or description. Strictly speaking, *selection* refers to the negative practice of eliminating from the candidates considered for possible employment those who appear unpromising. It involves the decision as to which of a number of candidates for positions are to be given an opportunity to work. *Placement*, as the term is used in connection with selection, refers to the determination of the positions to which accepted candidates are to be assigned. It is the process of assigning newly selected employees to their tasks and responsibilities in the business organization. *Vocational guidance*, insofar as it enters into the duties of the personnel manager (and it is not a responsibility which such executives ordinarily seek or for which they are properly prepared), refers to the inevitable direction given to the careers of newly employed workers in the selective process and in their assignment to particular divisions and positions. Finally, the *follow-up* refers to the practice of checking up on the effectiveness of selection and placement by making a

special effort to discover, at regular intervals following placement, how effectively the worker is fitting into the position to which he has been assigned.

Selection procedure. Procedure in selection necessarily varies among industries and among firms within these industries. In practically all cases, however, the process begins with the original reception accorded new applicants. That reception in and of itself may be highly significant in conditioning employee reactions to management. It usually includes a preliminary interview, generally quite brief, and the filing of an extended application blank. If the characteristics discovered in the preliminary interview and the written application appear appropriate to existing or anticipated labor needs, the next step may involve either testing, or, if tests are not so used, a secondary interview, although many concerns test and re-interview as well. Meanwhile, references mentioned on the application blank may be consulted, and analysis of previous experience with other employers is appropriate. Finally, applicants may be referred to medical departments for physical examination, if that is required, or they may be sent directly to divisions in which they can be used for final consideration by those in charge of such divisions, thus effecting placement.

Where the induction of new employees has been carefully planned, placement may involve a number of steps. New-comers are introduced to fellow workers. They are presented with a handbook which describes the labor policy of the employer and the formalized rules governing employment. Older employees may be asked to act as sponsors for new-comers. New employees may be asked to sign an employment contract and to furnish additional personal information for personnel records. Finally, those in charge of selection and placement often practice a follow-up on all recent employees, in which management seeks to learn whether new workers have been appropriately placed, have made proper adjustments, have been graciously received, and are, from

every angle, satisfactorily and happily settled in their new positions.

Placement procedure is, in other words, a complicated and extended process. Naturally, not all the features mentioned receive the same emphasis in all firms. But each requires consideration in any discussion of modern selective functions of management.

Objectives of selection. The modern selective program seeks to make use of every available means by which positions may be filled by individuals most nearly having the characteristics disclosed by job specifications to be requisite for each position in the organization. It recognizes the advantages of carefully selecting workers and fitting personnel to the positions to be filled at the same time that it seeks to avoid the usual deficiencies of job-filling procedure. It appreciates the natural human tendency to avoid the tedious work necessary to careful selection as well as the equally common and more dangerous tendency of many persons to believe that they can identify desirable applicants by personal observation, can determine, by unassisted personal judgment, just which candidates have genuine ability and promise. In a sense, the whole extensive selection procedure of modern personnel management may be said to have developed out of a recognition of the impossibility of determining by mere subjective judgments which applicants are potentially the most desirable, as well as out of a realization that such judgments have formed the most important basis for selection in the past. At the same time, present-day procedure seeks to avoid other weaknesses that have long featured selection in many organizations, including, as notable types of such deficiencies, personal bias and prejudice, favoritism, unreasonable preferences for one group or another, such as one religious denomination or one fraternal group, and, most important, a general disregard for evidences of promise on the part of applicants that are not readily observable from an application blank or a personal interview.

The selective process. The process of selection, reduced to its simplest form, involves the careful correlation of human characteristics and job requirements, to the end that the individual may fit the job. Such a process requires for its efficient operation (1) the discovery of important features of the job (the task of job analysis), and (2) the recognition and measurement of distinctive human characteristics (the particular function of those who are engaged in selection). Human qualities are, however, difficult to describe, to classify, and to identify, and it is this fact that makes the selective process a complicated one. Individuals are known to exhibit a wide range and a varying degree of mental abilities, and the combinations of these characteristics with physical and cultural features are probably infinite in number and variety.

Even a layman's simple classification of the types of features that are combined in the individual will indicate how complex is their combination. There are, of course, the most obvious physical features: age, height, weight, sex, racial type, strength, and appearance. There are the recognized mental characteristics: intelligence, special capacities or talents, such as musical ability or memory, and emotional state or disposition. There is a wide range of cultural features, such as education, national and racial customs and conventions, family traditions, special skills, and trade knowledge. There is that rather indefinite but highly important combination of all these types of features—character—sometimes defined as the organized habit-structure of the individual, which defines his attitudes and his behavior with respect to questions of honesty, integrity, and reliability. Finally, there is that especially indefinite conception of the whole person, the combination of physical, mental, emotional, and cultural characteristics, that is usually referred to as personality. By definition, it is the sum and organization of all the characteristics of the individual that distinguish him from all others, but it is obvious that, highly important

as it may be for certain positions, it is an extremely complicated quality, difficult to analyze or classify.

It is the task of selection to consider all these and many other subordinate characteristics of the individual applicant, to classify and, if possible, to measure the features that have particular significance for the job to be performed. Under the circumstances, it is not surprising that the selective function in modern industry is both one of the most interesting and at the same time one of the most difficult obligations of modern management.¹

Observational methods. In any classification of methods of selection, observational methods must be given first place as far as their development in time is concerned. They are the oldest methods. They are described as observational because major emphasis is placed upon the recognition of certain obvious, external, physical characteristics of the individual under consideration. In its simplest form, an observational method involves merely "looking over" the individual and forming a conclusion, as a result of such a cursory examination, as to the ability and fitness of the candidate. In essence, it is highly similar to the usual procedure in judging live stock.

But observational methods do not always end with such a cursory examination. They may involve more minute inspection with especial attention to one's handwriting (graphology), or the shape of the head (phrenology), or the lines in the palm (palmistry), or more complicated combinations of these features. They reach their high point in what is known as the "character analysis," in which the character of the individual is allegedly determined by reference to certain physical features. Best known exponent

¹See, as illustrative of these problems, Beckman, R. O., "Standardizing the Selection of Apprentices," *Journal of Business* (University of Chicago), July, 1932, Vol. 5, No. 3, pp. 228-240; Smith, May, "The Temperamental Factor in Industry," *The Human Factor*, September, 1933, Vol. 10, No. 9, pp. 301-304; Hay, Edward N., "Hiring an Advertising Assistant," *Personnel Journal*, April, 1937, Vol. 15, No. 10, pp. 177-179.

of character analysis is Dr. Katherine Blackford, whose general thesis holds that all such important personal characteristics as honesty, loyalty, industry, accuracy, and care, can be "unerringly appraised" as a result of observation in which the prominence of nine physical characteristics is noted. These definitive features listed by this internationally famous exponent of character analysis include skin color, general form, size, structure, skin texture, consistency or flexibility, sense of proportion, expression, and reflection of environment.²

Less famous exponents of character analysis frequently operate, consciously or unconsciously, upon the basis of similar assumptions, and many of those who have been charged with responsibility for selection fall into this class. They conclude, for instance, that blondes are less reliable than brunettes, that big men are apt to depend upon their size and are therefore less dynamic than small men, and they make such conclusions a basis for their selective policies.

It should not be necessary to note that all such methods fall into the general category of unreliable if not actually fraudulent devices. Their unreliability has been repeatedly demonstrated. The fact that they persist is an unmitigated tribute to the gullibility and ignorance of those who resort to them.³

More common than the technique of character analysis, which is, after all, rather complicated, is the resort to physiognomy, the determination of character by reference to more obvious facial and physical characteristics. Interpretation of this sort received tremendous impetus from the early publications of Lombroso, who sought to define the physical characteristics of what he regarded as the criminal

² There are other well-known specialists who have found the practice of character analysis profitable. See, for a more recent case in point, the story of Dr. H. W. Merton in *Fortune*, October, 1935, p. 14ff.

³ Ford, Adelbert, "A Check on Character Analysis," *Personnel Journal*, August, 1930, Vol. 9, No. 2, pp. 121-123.

type. Many of the features upon which this theory places greatest emphasis will be recognized as important elements in the folklore of contemporary society. It notes, to mention only the most generally regarded of the significant characteristics, the shifty eye, the lofty brow, the massive or receding jaw, the clammy hand, thin lips, prominence of the ears, prominent veins, thin skin, dimples and wrinkles, nose shape, finger form, posture, the "shifting gait," and the color of the eyes.⁴ To each such feature, it assigns a special and almost mystical significance.

Needless to say, no scientific proof of any save the most obvious of such relationships is available. On the contrary, experimentation has repeatedly disclosed the utter unreliability of all such criteria. They persist because, primarily, individuals do not recognize the tremendous probabilities of natural chance associations. It is likely, for instance, that a large group of persons, all of whom have clammy hands, might reasonably be divided into two equal parts, one made up of those generally regarded as reliable and the other made up of unreliable persons. In that case, there is a fifty-fifty chance that any person selected from the group will be found to be unreliable. And since there are, in actual practice, degrees of reliability, good showmanship can make the selection appear much better than even the 50 per cent probability guaranteed by the laws of chance.

Closely allied to the observational methods mentioned in preceding paragraphs is phrenology and its companion adventures into the significance of head shapes. Such approaches place special emphasis upon the significance, in terms of character, of head length and breadth, facial topography (including the length of the nose, the shape and slant of the eyes, form of the chin), and neck shape and structure. Phrenology, however, is not limited in its use merely to the definition of character, for it is also advocated

⁴See, Hollingsworth, H. L., *Vocational Psychology and Character Analysis*. New York: D. Appleton-Century Company, Inc., 1929.

as a means of foretelling the future and thus falls into a class with astrology and numerology.

In general, modern selective programs are agreed upon a single conclusion with respect to all such observational methods. That conclusion holds that character and personality, complex as each is, can never be adequately read from external features. It relegates such features, therefore, to the position to which they are obviously qualified. It holds that if appearance is a matter of importance on the job, then appearance, for its own sake, must be taken into account. Thus, if selection of a male model for a collar advertisement were involved, a handsome face and profile would be highly important, and observation would prove an essential tool. To the extent that appearance is important on the job, appearance must be taken into account just as any other important characteristic would be. But appearance should not be allowed to determine the appraisal for any characteristics other than those involved in appearance.

This conclusion is of importance in several connections. It warns against reading too much into facial expression, either from personal contact or from examination of photographs. Several experiments have shown the fallibility of pictures as guides to character.⁵ Evaluation of the individuals whose photographs are examined shows no greater than chance accuracy as far as estimates of intelligence, vocational aptitude, or personality are concerned. The only reasonable conclusion is, therefore, that if appearance is important on the job, then it must be evaluated for that reason. But it cannot be regarded as indicating much more than that.

Modern practice. In modern practice, there are about ten types of characteristics most commonly taken into consideration as a basis for selection. The amount of emphasis placed upon any one of them varies from position to position, and there are, of course, other less frequently regarded

⁵ See, for instance, Husband, R. W., "The Value of Photographs on the Application Blank," *Psychological Bulletin*, October, 1933, Vol. 30, No. 8, p. 577ff.

qualities. In the majority of cases, however, it will be found that attention, in the selective process, is directed at most of or all the following characteristics of the persons under consideration:

1. Experience. This quality is repeatedly regarded as highly important, although, in many cases, undue emphasis may be placed upon it, especially if extended experience is regarded as indicating greater value. There is reasonable doubt, for instance, whether the fact that a clerk or stenographer has fourteen years' experience means that the operative is superior to one with two years' experience. A recent rather comprehensive study⁶ arrives at the following conclusion on that point:

. . . employers tend to emphasize experience at the expense of abilities in selecting new workers. . . . But there is considerable evidence that employers are overlooking substantial bargains when they emphasize experience as the primary qualification, without due regard to aptitude and abilities. A person with high aptitude, though without experience, may frequently prove to be a better worker than an experienced worker of mediocre or inferior aptitude and ability.

2. Physical characteristics. They may be highly important for certain types of work. Too great emphasis upon them borders, however, upon the weaknesses of observational methods, noted in preceding paragraphs.

3. Mental alertness. A general term, mental alertness is expressed in a variety of forms. In some it refers to ability in abstract thinking, in others to keenness of observation. In general, however, it is used synonymously with intelligence.

4. Attitude toward employment. In most cases, assessment of this characteristic seeks to discover whether the applicant desires employment merely as a means of earning or whether he is ambitious and seeks advancement. Frequently, it is important to know, also, whether or not the applicant considers affiliation with the employer as a comparatively

⁶Paterson, Donald G., and Darley, John G., *Men, Women, and Jobs*, p. 83. Minneapolis: The University of Minnesota Press, 1936.

permanent relationship or merely as a temporary stop-gap arrangement.

5. Adaptability. In modern industry the continuing rapidity of technological change has placed an increasing premium upon adaptability, as has the general provision of unemployment insurance. Employment stability, from both long- and short-time angles, frequently depends upon the ability of the employee to perform several types of work.

6. Education. Educational attainment is regarded both as a mark of the abilities of the individual and, in many cases, as a necessary attribute of the successful operative. Frequently, special types of education are relevant to the job, as is the case with bookkeepers, stenographers, stock and bond salesmen, and others.

7. Age. The provision of general old age pensions, if it reduces the necessity for company retirement provisions, may tend to make consideration of age somewhat less important. At present, however, age is often regarded as highly important as a criterion in selection. This is true, in part, as will be noted in subsequent chapters, because it affects eligibility for and costs of group insurance and retirement plans, as well as ability to perform the work to be done.

It is highly possible, however, that the significance of age may be greatly exaggerated by many managements. Certainly, its emphasis results in serious social problems, not to mention numerous personal difficulties and disorganizations. There is no reliable information as to the extent to which hiring limits are enforced throughout the nation, but numerous studies of particular areas have found 30 to 40 per cent of all employers practicing such selection, with public utilities, petroleum, clothing, and iron and steel leading among various industries in the number of firms and of workers involved. In 1937, the Massachusetts Department of Labor and Industries completed a two-year survey, in which it was discovered that approximately one half of all employers of ten or more employees "discriminated intentionally or unintentionally" against persons over 45 years of age. Through-

out a twenty-two month period, 40 per cent of the firms reporting having hired additional workers accepted no new employee over 45 years of age. At the same time, 60 per cent of the firms having employed additional women included no women over 45 in their accessions.⁷ The study suggests the need for careful reconsideration of hiring policies on the part of many concerns. It is quite possible, also, that public action to assist firms that can and do employ older workers might be entirely justifiable.

8. Sex. Sex is an obviously important consideration for many types of position.

9. Personality. This almost indefinable characteristic may have great importance if the candidate is to meet the public or to be charged with responsibilities involving leadership. Its analysis and measurement represents one of the greatest problems underlying the whole field of personnel administration.

10. Appearance. As has been indicated, appearance may be highly important, in and of itself. It cannot be objectively measured, but it can be rated or described in a fairly satisfactory manner.

Selective devices. A major part of the attention given to problems of selection in recent years has sought to discover devices that aid in the definition and measurement of the characteristics described in the preceding section and such others as, in one or another position, appear to be important. To a considerable extent, such study has sought to make widely used tools more effective at the same time that it sought to discover and perfect new tools with which to supplement the old. Thus it has aimed at the improvement of application blanks as an aid in selection. It has sought to make interviewing more effective, and has studied the value of references secured in a variety of ways. Finally, it has developed and attempted to standardize numerous tests, so that subjective judgments might be supplemented

⁷ *Survey of Labor Law Administration*, pp. 3-4. Washington: Division of Labor Standards, Department of Labor, March, 1937.

by more objective measurement of salient and significant personal characteristics. The net result is the provision of an increasingly valuable kit of tools, by means of which selection may be made more effective. Several of the most important of these deserve mention.

Written Applications. The general nature and purpose of application blanks have been discussed in the preceding chapter. Here it is necessary only to note one or two important features of such devices. They should, it has been said, be adapted to the job to be filled. They may, it might be added, be adapted to the type of worker for whom they are intended. For more important positions, where those to be considered are of definitely higher educational and cultural attainment, application forms may well reflect this feature in their wording, their directions, and their appearance.

For certain types of positions, blanks should provide a space where a photograph may be attached. That the photograph is not to be used as a means of estimating intelligence, vocational aptitude, or personality as a whole is obvious. Husband has demonstrated the fact that rating of such qualities from photographs is no better than pure guesswork. But, as has been noted, appearance in itself may be important in many positions, and the photograph is of value in such cases. Moreover, it may help the interviewer to recall other characteristics of the individual ascertained in the original interview.

Many firms provide two distinct classes of application blanks. One is a preliminary form, small and of a material that may be conveniently filed, which is used entirely to record a few essential facts about applicants when no opening for such a person is known to exist. The second, much more detailed, is filled out only by those for whom there is a position waiting.

The employment interview. Aside from the application blank, no other device is so generally used as a basis for selection as the interview. In some cases, not one but sev-

eral interviews may be had with applicants, but in almost every case, the candidate is subjected to at least one interview, and the results of these personal conversations and examinations have great importance in determining which candidates shall be regarded as acceptable for placement.

Studies of interviewing have disclosed that many considerations must be taken into account if such conferences are to be made most effective, and only a few of the more important of them can be discussed here. For a more extended treatment, the reader is referred to one of several excellent studies that have analyzed and evaluated interviewing techniques.³

The purpose of the interview should be clearly defined in the mind of the interviewer. For purposes of selection, the interviewer seeks to gain information with respect to the applicant, but it should be understood that interviews can do much more than that. In some instances, for example, they may be used to inform or teach those who are being interviewed, while in others there may be an intention to control or reshape the behavior of the individual.

It is important that the interviewer shall recognize his own tendencies toward bias or prejudice, if the interview is to produce reliable information. He must be wary of the temptation to allow physical characteristics to exert an undue influence upon his judgment, and he must overcome a persistent tendency to fall into the habit of regarding individuals as stereotypes, thus attributing to them characteristics not actually disclosed. Leading questions must be avoided, for obvious reasons, if answers are to be taken at

³ See the collateral readings at the close of the next chapter. See also Uhrbrook, Richard S., "Analysis of Employment Interviews," *Personnel Journal*, August, 1933, pp. 98-101; Bingham, Walter V., and Moore, Bruce V., *How to Interview*, New York, Harper & Brothers, 1931; Moore, Bruce V., "Personal Interview, An Annotated Bibliography," New York, Personnel Research Federation, 1928; Thompson, Lorin Andrew, Jr., et al., *Interview Aids and Trade Questions for Employment Offices*, New York, Harper & Brothers, 1936; *Interviewing and Case Recording; A Selected Bibliography*, New York, Russell Sage Foundation, 1931; and Smeltzer, C. H., and Adams, C. R., "A Comparison of Graphic and Narrative Interview Reports," *Personnel*, November, 1936, Vol. 13, No. 2, pp. 41-45.

their face value. Further, there is little point in asking questions whose answers are already apparent from the application blank, and interviewers should generally have the information available from that blank well in mind before talking with the candidate.

The physical surroundings are important. The interview should be private, so that both parties may speak confidentially and without restraint, and glass partitions may be undesirable if they give the candidate the impression that he is being scrutinized from outside. It is usually desirable that provisions for waiting rooms used by candidates pending the actual interview should segregate sexes, and similar segregation for races or nationalities may be desirable under certain conditions.

Interviews should be unhurried and should allow the candidate the informality necessary for him to appear as his usual self. What is desired is a view of the candidate in his ordinary rather than his interviewing behavior. Generally, it is worth while to attempt to discover persons or subjects of mutual interest as a basis for informal conversation, because, by such means, the interviewer may generally avoid the appearance of forcing the conversation. It is important that the interviewer give the candidate an opportunity to talk, although control of the session must necessarily remain in the hands of the interviewer. Greatest benefit will be gained when the interviewer has successfully secured the confidence of the candidate, and effort to gain and hold that confidence must represent a constant responsibility of the effective interviewer.

Many interviewers find it worth while to have, as an interview aid (in addition to the application blank previously filed by the candidate), a check-list or itemized notation of the principal types of facts to be secured in the interview. By surreptitious attention to the check-list, the interviewer avoids a failure to secure desired information, and sometimes a notation on the check list provides a convenient

means of recalling essential facts with respect to the applicant.

References. Most application blanks contain a request for the names of references who can and will provide information as to character or performance in positions previously occupied. The general purpose of such references is to provide a means whereby the judgments of preliminary interviews may be supplemented by those of several disinterested persons who know the candidate.

Whether or not references are to be included in the application form depends upon the use that is to be made of references. If they are to be disregarded entirely, as some studies have shown to be true for as many as half the companies investigated, then the desirability of including them is doubtful. It is felt, of course, that they impress employees with the care used in their selection, and they may have some slight value, from this viewpoint. But the fact that they are seldom if ever utilized is likely to become known to employees and to applicants as well, in which case their inclusion merely clutters up the application files.

If references are to be used, it is important that the relationship of the candidate to those to whom he refers be carefully determined and taken into account in evaluating the opinions expressed. Moreover, it is probably worth while to have a special form prepared, so that opinions may be reported reliably. A satisfactory form used by one large firm in making inquiries of references is shown in Figure 12. The usual letter of recommendation is apt to be couched in such general terms as to be worthless. Moreover, the practice of recommending highly, in general terms, in order to get rid of an employee, is not unusual in modern business. For that reason, in writing to references, specific questions should be asked, and correspondents may be requested to evaluate particular characteristics of candidates in terms of known larger groups or mutually known individuals.*

*See, Morgan, Earl B., "Ethics and Methods of Handling References," American Management Association, *Convention Series*, No. 54, 1927.

<p style="text-align: right;">_____ 19__</p>	
<p>Mr. _____ age _____ has applied for position of _____ He states that he was in your employ as _____ from _____ We will thank you for answers to the following questions regarding his record while in your service. Your answers will be held strictly confidential. Yours respectfully,</p>	
<p>Per _____</p>	
<p>QUESTIONS</p>	<p>ANSWERS</p>
<p>1. On what date did he enter and leave your employ?</p>	<p>Entered _____ Left _____</p>
<p>2. What position did he fill?</p>	<p>_____</p>
<p>3. A. Was his service satisfactory? B. Do you consider him competent to fill the position for which he is an applicant?</p>	<p>A _____ B _____</p>
<p>4. For what reason did he finally leave your employ?</p>	<p>_____</p>
<p>5. A. While in your employ did he have the custody of money? B. Were his accounts in satisfactory condition when he left?</p>	<p>A _____ B _____</p>
<p>6. Are you connected with the applicant by relationship, or otherwise? If so, in what way?</p>	<p>_____</p>
<p>7. A. Is he, or has he at any time been, addicted to the use of liquor, or given to gambling, immorality, or other bad habits? B. If so, show how what they are, and to what extent.</p>	<p>_____</p>
<p>8. Has he ever been suspected of dishonesty?</p>	<p>_____</p>
<p>9. Has his general conduct been such as to entitle him to the confidence of his employers?</p>	<p>_____</p>
<p>10. Is he engaged or interested in any business or undertaking at present?</p>	<p>_____</p>
<p>11. Has he ever failed in business; if so, please give circumstances and terms of settlement.</p>	<p>_____</p>
<p>12. How long and by whom was he employed prior to his service with you?</p>	<p>_____</p>
<p>13. How and by whom was he employed after leaving your service?</p>	<p>_____</p>
<p>14. Was he ever dismissed or suspended from any employment; if so, why?</p>	<p>_____</p>
<p>Please make any general remarks on back of this sheet.</p>	
<p>Signature _____</p>	<p>Business or Occupation _____</p>
<p>Date _____</p>	<p>Address _____ Printed in U. S. A.</p>

Fig. 12.—Request for Information from References.

Personal calls on references are even more satisfactory. *Selective tests.* In recent years, increasing attention has been given by management, numerous individuals, and research agencies to the possible contributions of various types of tests to the selective function of personnel administration. With the popularization of intelligence tests, many persons who failed to appreciate the complex nature of the

human being saw, or thought they saw, a marvelous new automatic selector, a device that would quickly and effectively supplant all the tedious procedure of interviewing, consulting references, and evaluating experience. It would take the guesswork out of selection and place it on a new, factual basis. Since that time, the early enthusiasm has been generally replaced with a much more realistic and critical evaluation, but the possible values to be achieved by effective testing are as greatly appreciated as ever, so that research and experiment continue on an expanding scale.

It is clearly recognized, however, by all those who are familiar with the use of tests in industry, that they do not and cannot take the place of all the older selective procedure. They are not simple, automatic, and certain indicators of desirable and undesirable applicants. They do not replace the personnel official. Rather they are highly valuable but highly complicated tools whose use increases the responsibility of the manager at the same time that it increases his effectiveness. They are valuable aids in supplementing impressions by means of judgments that tend to become objective. But their use requires a thorough understanding of their nature, their potentialities, and their limitations. It is necessary to discover, for instance, what tests have value in selecting particular types of employees, which tests are applicable to the particular selective problem. In many cases, that means that criteria for their evaluation must be identified, and careful, complicated analysis may be necessary to evaluate the relationship between various tests and selected criteria. These are but a few of the many problems that must be faced if tests are to be used.

There is a wide variety of selective tests available to modern management, and no classification of them is entirely satisfactory. In part, the difficulty in classification arises from the fact that many of the tests evaluate highly complicated rather than simple human characteristics. Thus, one general group of tests seeks to measure human mental

capacities, the potential mental abilities of the individual. Such tests are generally described as aptitude tests, and intelligence tests are of this type. Aptitude scales may be distinguished from those that seek to measure proficiency or achievement. In the first group are tests of musical, mechanical, or juristic ability, while the second would include trade tests of various sorts, all designed to discover, in this case, the extent to which the individual has mastered the skill and knowledge of a particular craft. Aptitude tests are not effective in distinguishing degrees of proficiency or specialization (the mechanical abilities tests, for instance, will not differentiate between plumbers and machinists), and they probably do not completely isolate aptitude from proficiency. Similar limitations are also imposed on most of the achievement tests. Still other types of tests are concerned with different aspects of the individual, such as his physical strength or his cultural characteristics.

For convenience in the subsequent description of the most common and useful types of tests, five major groups may be tentatively outlined, including: (1) intelligence or mental alertness tests (aptitude tests), (2) tests of special mental characteristics (also aptitude tests), (3) tests of physical features, (4) tests seeking to measure combination mental-physical ability (generally tests of trade or job proficiency), and (5) tests of such highly complex features as character, personality, and interests.

Intelligence tests. One of the most commonly used of the formalized tests applied to workers is the intelligence test, which has been used in examining applicants for positions in which intelligence appears to be a matter of importance since the time of the World War. The intelligence test is designed to measure the ability to learn, a definition of intelligence that explains the early use of these tests by Professor Cattell of Teachers College, Columbia University, in 1894. World-wide scientific interest in such tests was attracted by their development by the French scholar, Binet, and popular attention was focused upon them, in the

United States, when the army alpha (verbal) and beta (non-verbal) tests were administered to some two million soldiers in the United States Army at the time of the war.¹⁰

Since that time, increasing numbers of business firms have found such tests useful in the selection of certain types of employees. Their use in industry obviously indicates an assumption that intelligence is a factor of importance in determining the worker's success on the job, and numerous careful studies have shown such an interrelationship.¹¹

The use of these tests is not so simple, however, as many managements assume. To begin with, the abilities measured by such tests are quite complicated, and it appears that there are several types of intelligence or mental alertness. For this reason, the test may not select the type of intelligence that is of particular importance to the position for which the test is given. Again, there are a variety of factors that may influence performance on the test, for which reason the conditions under which it is given must generally be standardized. Even when they are so controlled, variations in personal factors make it desirable to have more than one test upon which to base conclusions.¹²

Tests may be secured from a variety of sources, and directions for administering them are available from their distributors. Care must be used, however, to see that the tests are taken under favorable conditions, that no disturbance is allowed to affect performance, that timing is accurate, and that other directions are followed carefully. It is desirable, if possible, that the tests be given by someone with training and experience in testing.

¹⁰ *Army Mental Tests*. New York: Henry Holt & Company, Inc., 1920.

¹¹ Beckham, Albert S., "Minimum Intelligence Levels for Several Occupations," *Personnel Journal*, December, 1930, Vol. 9, No. 4, pp. 309-313; Kornhauser, A. W., and Kingsbury, F. A., *Psychological Tests in Business*, Chicago, University of Chicago Press, 1924; Unger, E. W., and Burr, E. C., *Minimum Mental Age Levels of Accomplishment*, Albany, N.Y., University of the State of New York, 1931.

¹² See, "Measuring Abstract Intelligence in Personnel Work," *Public Personnel Studies*, No. 7-8, May-June, 1929, Washington, Bureau of Public Personnel Administration; and Pentner, Rudolph, *Intelligence Testing, Methods and Results*, New York, Henry Holt & Company, Inc., 1931.

When intelligence tests are used to measure the abilities of children, results are most commonly expressed in the form of *intelligence quotients*, which represent the ratio of mental age, as defined by test performance, to physical age. Test scores of adults, however, are not reduced to this form for rather obvious reasons, but are expressed as percentile ranks based upon norms derived from extensive experience with the tests.

Special aptitude and capacity tests. In many cases, use of intelligence tests will suggest the need for special tests of particular mental abilities. In other words, it will be discovered that the general characteristic, intelligence, is too all-inclusive to represent a satisfactory means of selection. Rather, what is required is some measurement of special abilities that are of particular importance on the job. The range of such abilities is suggested by Professor Truman L. Kelly's classification of the group factors included in the basic human mental organization. Kelly lists nine classes of group factors, including abstract verballity, spatial relations, numerical ability, motor abilities, musical abilities, social intelligence, mechanical intelligence, interests, and strength. Special tests designed to measure the prominence of each of these factors may be found to be much more appropriate in selection for various positions than the general intelligence tests. At the same time, however, it must be understood that each of these basic features of man's mental and physical organization appear in varying quantities, and they are associated in all sorts of combinations and permutations. It is generally admitted that accurate measurement of their significance in any individual case may not be possible for many years, for the development and verification of tests for this purpose will require long continued investigation and experimentation.

There are, however, numerous tests of special mental abilities that are now available, and many of them have been sufficiently widely utilized to indicate that they have genuine merit. Among the best known of such tests are those of

visual acuity, which rate the acuteness of vision; and those that evaluate the breadth or width of vision (tests of peripheral sight), color sensitivity, and other phases of vision. That such features are of importance in business and industry will be clear. The peripheral vision of streetcar motormen, truck and bus drivers, railway engineers, and other workers in similar positions is a matter of unusual importance, as is their color sensitivity. Other tests measure sensitivity to sound, which is a matter of importance in many occupations. Still others measure skin or touch sensitivity, a feature of importance if smoothness or abnormal heat or cold is to be discovered.¹³

Still other tests seek to evaluate judgment or reasoning power, while others are designed to detect and evaluate imagination, memory, initiative, attention, emotional stability, and musical talent.¹⁴

The fundamental difficulty encountered in the use of all such tests is the isolation of special abilities that may be of major import in the job. If the job analysis successfully discloses the nature of the special abilities required, it is not impossible, in most cases, to find selective tests by which to measure the relative presence or absence of these abilities as they feature individual applicants.¹⁵

¹³See Clarke, Walter V., "Employment Testing," *Personnel*, February, 1937, Vol. 13, No. 3, pp. 114-117.

¹⁴Tests of special abilities and aptitudes are appearing in increasing numbers, so that any catalog of them is necessarily incomplete. A sample list of those in use at the present time might, however, include as typical the *Seashore Measure of Musical Talent*; the *Meier-Seashore Art Judgment Test*; Snow, A. J., *Chronoscope*; Roback's *Scientific-Juristic Ability Test*; the *Stenquist Assembly Test*; *The Aptitude Test for Nursing*, (F. A. Moes, and T. Hunt); *The Minnesota Vocational Test for Clerical Workers*, (D. M. Andrews and D. G. Paterson); *The Scott Company's File Clerk's Test*; *The Minnesota Mechanical Assembly Test*; and *Minnesota Spatial Relations Test*.

¹⁵See, Andrews, D. M., and Paterson, D. G., *Measured Characteristics of Clerical Workers*, Minneapolis, University of Minnesota Press, 1934; Hull, Clark Leonard, *Aptitude Testing*, Yonkers-on-Hudson, N.Y., World Book Company, 1928; Watts, Frank, "The Construction of Tests for the Discovery of Vocational Fitness," *Journal of Applied Psychology*, 1921, Vol. 5, pp. 240-247; Harding, Denys W.; "Alternative Capacities for Type-writing," *Human Factor*, March, 1937, Vol. 11, No. 3, pp. 97-105.

Exercises

1. Frame a letter to be used in writing to references given by candidates for employment.
2. Report on one of the articles and studies mentioned in footnotes throughout the chapter.
3. Prepare an outline of the various selective tests used in modern industry, indicating the criterion by which each class is defined.

CHAPTER VIII

Selection (*Continued*)

PHYSICAL features are a matter of importance in many positions. In some cases, it is the general physical condition that matters, and, for such situations, the general physical examination is of course prescribed. In others, however, special physical abilities are requisite. It may be necessary, for instance, that the worker have great back strength or unusual strength in arms or legs. In some jobs the strength of hands may be a matter of importance, and the necessity for other particular types of strength appears in still different jobs.

A variety of mechanical devices for measuring special types of strength is available. A universal dynamometer, designed by Kellogg, will measure various types of physical strength, and specialized devices, which test arm, leg, or hand power are available or may be constructed. Such devices will disclose surprising differences among employees. Extensive experience serves to show, for instance, that as far as over-all measurements of strength are concerned, whites measure somewhat higher than negroes; that, as might be expected, right hands are stronger in some cases, lefts in others; and that the ratio of power in the strong hand to that in the weaker is apparently about 1000 to 840.

Combination physical-mental traits. Strength is by no means the only physical trait that is of importance, but most of the others appear to represent combinations of physical and mental features. Such, for instance, is the case with most skills and aptitudes, of which a great many appear as important features of particular jobs. A number of tests are designed especially to measure these combination traits.

Among the tests designed to evaluate these special aptitudes are the finger and tweezer dexterity tests designed by Johnson O'Connor, in which the applicant is required to place small pegs in round holes and is timed to measure his aptitude in the process; the various mechanical ability or assembly tests, in which applicants are timed as they assemble numerous small household instruments and simple tools from a mass of parts (typified by Stenquist's test and the Minnesota Mechanical Ability Test); and the tests of spa-

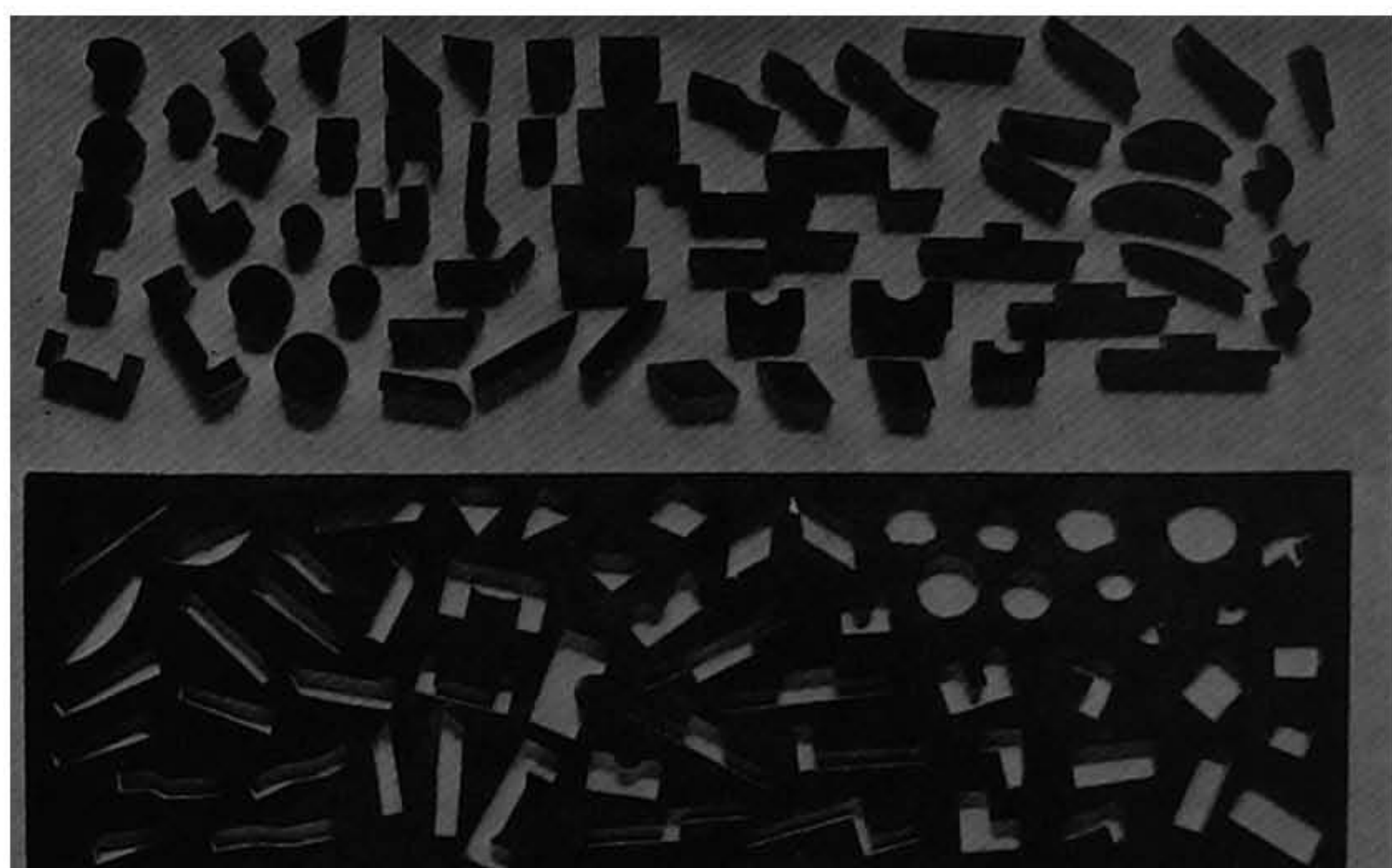


Fig. 13.—Minnesota Spatial Relations Test Board D. (Source: University of Minnesota Employment Stabilization Institute.)

tial relations involving some kind of form board (illustrated in Figure 13), of which the best known is probably Link's. Numerous others, representing similar attempts to create, under standardized conditions, sample problems of the sort to be found on the job, have been prepared and used by individual firms and in attacking particular problems. Those mentioned represent, however, tests that have been widely used and for which standards of performance are adequately defined.

Trade tests. Frequently it is desired to discover to what extent an individual possesses the combination of knowledge

and skill generally characteristic of craftsmen in a particular trade, and efforts have been made, over a period of years, to provide simple tests by means of which those who have such knowledge and skill might be readily identified. Most commonly utilized, for this purpose, is the trade test, which has been described by one of those who has done most to perfect such devices as an instrument designed "to make it possible for a trained examiner, unskilled in any particular trade, to measure in objective terms the trade standing of any recruit claiming skill in any of the several hundred trades."¹ More recently, the widespread organization of public employment offices and their efforts to discover skilled craftsmen and others who could work effectively upon public works projects have resulted in extensive revision and extension of such tests and more general experimentation with them.²

Principal emphasis has been given to oral types of trade tests. In that form, such tests consist of a series of questions which, it is believed, can be satisfactorily answered only by those who know and thoroughly understand the trade or occupation. A few samples of such questions will make clear their general nature. From one of the most recent of such tests for a general automobile mechanic, for instance, the following questions are taken:

1. What are steering column bushings made of?
2. What joint is there between the differential and the transmission?

¹ Chapman, J. Crosby, *Trade Tests, The Scientific Measurement of Trade Proficiency*. New York: Henry Holt & Company, Inc., 1921.

² See, in this connection, Thompson, Lorin Andrew, and associates, *Interview and Trade Question for Employment Offices*, New York, Harper & Brothers, 1936; Green, H. J., and others, *A Manual of Selected Occupational Tests for Use in Public Employment Offices*, Minneapolis, University of Minnesota Press, 1933. The authors recommend, for this purpose, the following tests: Pressey Senior Classification Test, Pressey Senior Verification Test, Minnesota Vocational Test for Clerical Workers, Johnson O'Connor Finger Dexterity Test, Johnson O'Connor Tweezer Dexterity Test, Minnesota Manual Dexterity Test, Minnesota Mechanical Assembly Test, Minnesota Spatial Relations Test, Strong Vocational Interest Blank for Men (Form A), and Women's Occupational Interest Blank.

25. At what stroke of the piston is the momentum of the flywheel used the least?

From the test for Diesel engine operators, the following questions are representative:

1. What is the main difference between a gasoline engine and a Diesel engine?
7. What *two* main features of a gasoline engine are missing on a Diesel engine?
11. What regulates the amount of fuel oil injected into the cylinder?

The oral form of trade test may be supplemented by written, picture, or performance types. As these descriptive titles indicate, the written type substitutes a series of questions to which candidates are to write appropriate answers. Picture tests provide for graphic answers to questions and are particularly appropriate in examining such operatives as electricians, draftsmen, and others. For some occupations, performance tests have been thoroughly standardized and are widely used. Such is the case, for instance, for stenographers and typists, and similar tests involving actual performance are available for dictaphone operators and those whose specialty is the operation of calculating machines.

In many cases, managements may find it necessary to develop special tests of occupational aptitude for particular positions. In preparing such tests, it must always be remembered that results may vary if they are not administered under standardized conditions. Further, if oral or written tests are to be used, it is important that the usual technical language of the trade be maintained and that questions be stated clearly and simply. Usual practice begins with simpler questions and proceeds to the more complicated ones. Questions are selected and phrased to facilitate short but definite answers, that is, answers about which no serious question can be raised. If tests are to be made of performance, it is generally desirable that they be so arranged that simple, readily available apparatus can be used. Complicated arrangements may, however, be found worth while,

such as the elaborate provisions simulating actual driving conditions, in which bus and truck drivers are tested for driving ability.³

Character and personality. Many highly important human characteristics, from the standpoint of satisfactory performance in given positions, represent complex combinations of mental and cultural features. Such, for instance, are the characteristics of honesty, reliability, stability, dependability, coöperativeness, loyalty, persistence, and that most elusive and poorly defined one, personality. Numerous tests that seek to evaluate such characteristics are available and many others are at present in a process of experimental usage, although they have, for the most part, been confined, in their application, to college and university students. One approach to the problem makes use of attitude scales by means of which the applicant's attitudes toward a variety of subjects may be evaluated.⁴ Pioneering studies in this field include Allport's Systematic Questionnaire, Pressy's X-O test, and various attempts to read minds by the numerous and much over-popularized word association tests,

³For discussions of specialized tests for particular operations, see, Beckman, R. O., and Levine, Michael, "Selecting Executives, An Evaluation of Three Tests," *Personnel Journal*, April, 1930, Vol. 8, No. 6, pp. 415-420; Nolting, Orin F., "A New Test for Selecting Policemen," *Public Management*, July, 1934, Vol. 16, No. 7, pp. 215-216; O'Rourke, L. J., *Office Employment Tests*, American Management Association, Office Management Series, No. 46, and "Tests for Civil Service Applicants," *Occupations*, April, 1934, Vol. 12, No. 8, pp. 29-39; Treat, Katherine, "Tests for Garment Machine Operators," *Personnel Journal*, June, 1929, Vol. 8, No. 1, pp. 19-28.

⁴Available attitude scales edited by L. L. Thurstone and published by the University of Chicago Press in 1931 measure student attitudes toward the church, war, the negus, prohibition, communism, treatment of criminals, patriotism, the federal constitution, birth control, the Chinese, Germans, Sunday observance, God, censorship, the Bible, evolution, capital punishment, and the law. Other measures of student attitudes developed at the University of Minnesota seek to discover the student's attitudes toward choosing a vocation, toward education, toward various types of social contacts, and toward various types of behavior. For a description of these tests, see, Williamson, E. G., and Darley, J. G., *Student Personnel Work*, New York, McGraw-Hill Book Company, Inc., 1937, p. 271ff. See also, "Written Tests of Honesty," *Public Personnel Studies*, July, 1929, Vol. 7, No. 7, pp. 93-106; Wadsworth, Guy W., Jr., "Temperament Tests as Personnel Aids," *Personnel Journal*, March, 1937, Vol. 16, No. 3, pp. 341-346.

in which the subject is given certain key words and asked to set down the word or idea they stimulate.

Another approach to the investigation and measurement of these complex characteristics is available in tests of interests. Best known of these are *Strong's Vocational Interest Tests* for men and for women,⁵ although there are others, some of which have been shown to be quite unreliable. Results of the Strong tests have been analyzed to indicate propensities toward or interests in a variety of occupations. The men's test, for instance, may now be scored for twenty-five occupations, and the women's test may be scored for seventeen occupations. The basis for the scoring is a "standardization" accomplished by their application to adults regarded as "successful" in each of these occupations, and research is continuing to the end that they may be still more broadly applied. An outstanding weakness of such predictions lies in the fact that the nature of many occupations, the types of problems with which they deal and the attitudes with which their work is undertaken, are undergoing constant change. The rise of a spirit of professionalism among grade school teachers or industrial personnel managers, for instance, would probably mean that criteria secured by reference to earlier and "successful" old-line incumbents would be quite misleading in gauging the requisite interests for new admissions to the field.⁶

Further, there are distinct limitations upon the extent to which interest analysis can be carried. As one recent study summarizes this point,⁷

. . . there is a point beyond which occupational groups cannot be distinguished from people in general on the basis of interest patterns.

⁵ Stanford Univ., Cal., Stanford University Press, 1935.

⁶ See, Strong, E. K., *Change of Interests with Age*, Stanford Univ., Cal., Stanford University Press, 1931; Cowdery, Karl M., et al., "The Outlook in the Measurement of Interests," *Personnel Journal*, August, 1930, Vol. 9, No. 2, pp. 176-183; Lehman, Harry C., and Witty, Paul C., "The Constancy of Vocational Interest," *Personnel Journal*, December, 1929, Vol. 8, No. 4, pp. 253-265.

⁷ Paterson, Donald G., and Darley, John G., *Men, Women, and Jobs*, p. 123. Minneapolis: The University of Minnesota Press, 1936.

Factory operatives, farm laborers, retail salespeople, and similar types of workers are essentially people in general and their interest patterns are substantially the same. This is to be expected, for it is only in those occupations or professions that are markedly different from the average that differentiation, either in abilities or in interests, is possible. Most of us could do the major portion of the world's work, since most of us are average people and most of the world's work requires nothing but average routine abilities.

In general, no satisfactory tests of the more complicated human traits are at present available. Attitude scales and interest analysis, together with a distinction between introvertive and extrovertive types, most closely approach the objective but leave much to be desired. The measurement of such vaguely defined features as character and personality is probably impossible, mainly because those who use the terms refuse to break them down and speak in terms of definable characteristics or traits. The result is that personnel management must avoid, as far as possible, definition of personnel needs in such vague and practically meaningless terms. Generally, individual self-analysis is unreliable as far as the elements in such concepts as personality are concerned, and the only satisfactory procedure at present seeks to isolate certain relevant, definable characteristics that may be tested or rated by interviewers and references who can speak authoritatively with respect to the candidate's performance.

Profile charts of test performance. In practice, it is convenient to summarize the results of tests for each individual in such form as to facilitate the comparison of performance among all individuals who have been subjected to the tests. Where several tests have been given in an effort to discover the possible relationship between performance on each of them and desired characteristics of employees, the profile type of summary illustrated in Figure 14 will be found useful. Test scores may be recorded in terms of percentile ranks when norms for this purpose are available or when the absolute scores have been otherwise translated into percentile form. In other cases, absolute scores may be re-

corded directly, or individuals may be marked in any other manner that is convenient and effective. Frequently, average test performance is designated by a heavy line at the center of the scale, and individual scores may be distributed

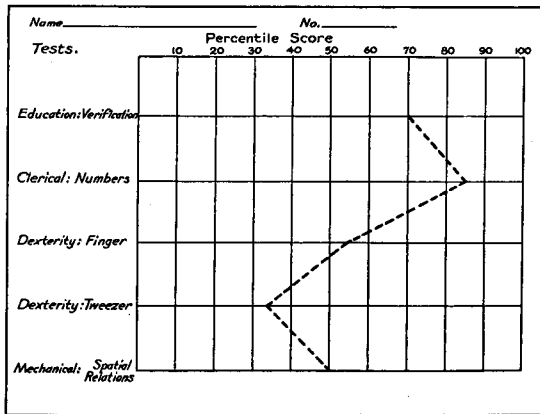


Fig. 14.—Simple Test Score Profile.

above and below that average in terms of standard or quartile deviation units.⁸ In still other cases, a smaller chart showing the position of the individual with respect to the average for all those taking the tests may be attached to the profile chart. In any case, the profiles formed by connecting the indicated scores on each test by straight lines may be readily compared to discover what patterns appear to represent the desired types of persons.

Limitations on testing. It must be clearly understood

⁸ See, *ibid.*, p. 80. The measure of quartile deviation used in such profiles is found by determining the location of first and third quartiles and then calculating the unit of quartile deviation as

$$Q.D. = \frac{Q_3 - Q_1}{2}$$

that there are definite limits upon the effectiveness of testing as a selective device. Many human traits, some of them (such as honesty, loyalty, personality, and character) of utmost importance in certain positions, are so loosely defined or so complex in nature that no completely satisfactory tests can be devised. Again, all tests are subject to variability arising from the circumstances, personal as well as physical, under which they are administered. From the standpoint of the individual being tested, it is important that results of any single test be regarded as tentative for a variety of reasons, and final dependence can not properly be placed on any single test. Furthermore, the reliability and validity of the tests must be constantly rechecked, as must their usefulness in the particular case at hand. Some of them have been so extensively used that they are thoroughly standardized, as is the case with the most commonly administered intelligence tests, but others have not enjoyed such extensive testing and cannot, for that reason, be regarded as entirely reliable. In many cases, tests may have to be "tailor made" for certain jobs, using item analysis to discover definitive items.

In large business organizations, it is possible to provide satisfactory physical facilities for testing and to have, on the staff, an individual sufficiently trained in testing to administer the various tests properly and to evaluate their results. For smaller firms, however, a testing program gives rise to serious problems, from the administrative standpoint. Generally, it is necessary to bring in a specialist from outside to administer tests and to analyze their results, or it may be necessary to send employees out to be tested. In the not distant future, it may appear feasible to provide public testing facilities, administered as a function of the public employment service, in order to provide properly for the needs of the many smaller concerns whose personnel problems may be equally as acute as those of the larger business units.

Finally, recognizing the large part that testing may prop-

erly play in the selective and placement programs of industry, it must always be remembered that tests supplement but do not take the place of other selective devices and processes. They can never take the place of good judgment on the part of personnel officials but, indeed, require additional judgment, for the proper tests must first be selected and administered, after which there remains the whole question of the interpretation of their results. Moreover, so many important considerations with respect to the worth of individual employees are not subject to evaluation by any test that tests must be regarded as but one aspect, one phase, of the whole selective process. Measurements derived from tests must, accordingly, be combined with conclusions arrived at as a result of interviews, references, and other sources of relevant information in rounding out a comprehensive selective program. Meanwhile, every person charged with responsibility for selection can and should carefully record and analyze resulting experiences with all such selective devices, as a means of contributing to the further advancement and perfection of each of them.⁹

Analyzing test results. It is frequently assumed that a testing program is practically an end in itself, that once tests have been given and scores obtained the full value of the testing program is immediately available. This is not, of course, the case, for the interpretation of test scores is one of the most important features of any testing program. It is immediately important, for instance, to discover the extent to which test scores are related to established criteria of success on the job. It must be clearly understood that there may be no simple relationship. Many managements have discovered to their surprise, for instance, that there is

⁹See, Anderson, Roy N., "Measurement of Clerical Ability; A Critical Review of Proposed Tests," *Personnel Journal*, December, 1929, Vol. 8, No. 4, pp. 232-244; Bronner, Augusta F., *Manual of Individual Mental Tests and Testing*, Boston, Little, Brown & Company, 1927; Persons, F. W., "The Psychologist Takes a Hand in Personnel Selection," *Aera*, August, 1929, Vol. 20, No. 8, pp. 462-467; Yoakum, C. S., *Present Limitations of Psychological Tests in Management*, American Management Association, Annual Convention Series, No. 21, 1925.

no close similarity between intelligence test scores and production, or sales, or other desirable characteristics of employees on particular jobs.

In order to use any kind of tests, therefore, much more detailed and intensive analysis of test results is essential. Studies may be made to determine what ranges of scores seem best suited to various positions in the business organization. Test scores and measures of performance or other criteria should be expressed in quantitative terms to facilitate such analysis.

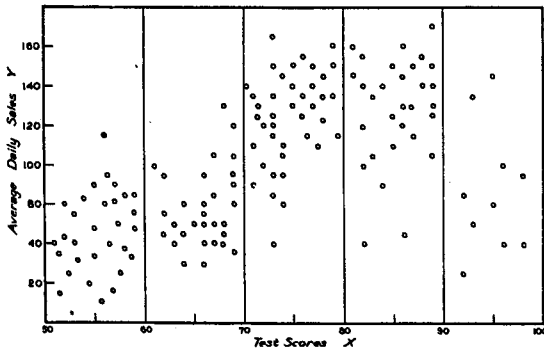


Fig. 15.—Graphic Comparison of Sales and Test Scores. (Data: sales and test scores of 154 retail salesmen.)

Satisfactory comparisons may frequently be made by graphic means. One of the simplest means of such analysis makes use of the bi-variate chart or scatter diagram, in which test scores are measured along the *X*-axis or *abscissa* and measures of the criterion with which these scores are compared are scaled on the *Y*-axis or *ordinate*. Such a chart is illustrated in Figure 15, where the data represent average daily sales and test scores of 154 retail salesmen. It will appear clearly, in this simple example, that the most effective workmen are those whose test scores fall between 70 and 90. Sometimes, test scores and measurements of the crite-

rion are divided into quartiles to determine which quartile of test scores shows most satisfactory performance, and other charting procedures may be effectively utilized in making necessary comparisons.

Statistical measures: simple correlation. It may be found worth while to compare mean scores of various groups of applicants or employees. Thus the average of scores for individuals from a given department or that of persons considered especially desirable may be regarded as establishing the level of performance on a test that suggests success on the job. Test scores of applicants may then be compared with these average scores of successful employees. In all such cases, regard must be had for the usual limitations upon conclusions drawn from comparisons of means (see Chapter VI, pages 120-123), lest erroneous interpretations result.¹⁰

In many cases, especially when several test scores are available and it is necessary to compare the relationship between each of them and some criterion of success on the job, a measurement of these relationships may be most useful. Probably the simplest statistical device for this purpose is that known as the ranking method of correlation. The measure of co-variation secured by this type of analysis is called the *ranking coefficient of correlation* (symbol, r_r).

The method is illustrated in Example 8, where the data are assumed to represent test scores and production data. They are obviously simplified for purposes of illustration. Analysis begins by pairing the test score and the measure of performance for each individual. Ranks are then assigned to the items of each series, beginning with either the smallest or the largest. If many ties appear, the ranking method should not be used, but if they are not numerous, tied items may be given their average value. Thus, each of three items that would have the ranks 3, 4, and 5 may be given the

¹⁰ See, Wadsworth, Guy W., Jr., "How to Pick the Man You Want," *Personnel Journal*, March, 1936, Vol. 14, pp. 330-335; Schultz, Richard S., "Standardized Tests and Statistical Procedure in the Selection of Life Insurance Personnel," *Journal of Applied Psychology*, October, 1936, Vol. 20, No. 5, pp. 553-566.

average rank 4. Ranks of paired items are compared, and their differences are noted, as is shown in column *d* of the example. These differences are squared, and their total is substituted in the formula for the ranking coefficient, as illustrated in the lower portion of the example.

EXAMPLE 8

THE RANKING METHOD OF CORRELATION

Data: (Assumed and simplified to facilitate explanation of method.) *X*, test scores; and *Y*, a measure of performance, the number of units produced per month, in thousands; *n*, the number of paired items.

Employee	Test Score		Units Produced		<i>d</i>	<i>d</i> ²
	<i>X</i>	<i>X</i> -Rank	<i>Y</i>	<i>Y</i> -Rank		
A	40	1	2	1	0	0
B	50	2	3	2.5	.5	.25
C	60	4	3	2.5	1.5	2.25
D	70	6	4	4	2	4
E	60	4	6	5	1	1
F	60	4	7	6	2	4
G	80	7	8	7.5	0.5	.25
H	90	8.5	8	7.5	1	1
I	100	10	9	9	1	1
J	90	8.5	10	10	1.5	2.25
					Σ <i>d</i> ² = 16.00	

$$r = 1 - \frac{6 \Sigma d^2}{n(n^2 - 1)} = 1 - \frac{(6 \times 16)}{10 \times 99} = 1 - \frac{96}{990} = 1 - .09697 = 0.9030$$

The ranking coefficient thus secured always ranges between -1 and +1. A negative value indicates that the series are so related that a high value in one of them is more or less generally associated with a low value in the other, and a positive coefficient shows that the high values in the two series are closely associated, as are low values. The decimal fractions usually characteristic of coefficients must not be regarded as percentages in the usual sense. The method provides a fairly satisfactory measure of co-variation for series in which ties are not numerous and where the intervals between items in each series are fairly uniform.

Where items are numerous, the ranking method becomes

extremely inconvenient, and ties may seriously affect the validity of results, so that calculation of what is commonly described as the Pearsonian *coefficient of correlation* (symbol r) is distinctly preferable. A simple method of measuring co-variation by means of the Pearsonian coefficient is illustrated in Example 9. Major steps in the process of calculation may be outlined as follows: (1) the arithmetic mean of each series is obtained; (2) the mean of each series is subtracted from each item in that series to measure the

EXAMPLE 9

SIMPLE PRODUCT-MOMENT CORRELATION

Data: (Assumed and simplified to facilitate explanation of method.) X , the test scores; Y , the numbers of units produced per month, in thousands.

Employee	Test Score	Units Produced	$X - M_x$		$Y - M_y$		xy
	X	Y	x	x^2	y	y^2	
A	40	2	-30	900	-4	16	120
B	50	3	-20	400	-3	9	60
C	60	3	-10	100	-3	9	30
D	70	4	0	0	-2	4	0
E	60	6	-10	100	0	0	0
F	60	7	-10	100	1	1	-10
G	80	8	+10	100	2	4	20
H	90	8	+20	400	2	4	40
I	100	9	+30	900	3	9	90
J	90	10	+20	400	4	16	80
Totals	700	60	0	3400	0	72	430

$$M_x = 70 \quad M_y = 6$$

Standard deviations:

$$\sigma_x = \sqrt{\frac{\sum x^2}{n}} = \sqrt{\frac{3400}{10}} = \sqrt{340} = 18.439$$

$$\sigma_y = \sqrt{\frac{\sum y^2}{n}} = \sqrt{\frac{72}{10}} = \sqrt{7.2} = 2.6817$$

The coefficient of correlation:

$$r = \frac{\sum xy}{n\sigma_x\sigma_y} = \frac{430}{10(18.439)(2.682)} = \frac{430}{494.78} = 0.8690$$

(Least highly significant value, see Appendix H, is .77.)

The coefficient of determination:

$$r^2 = .869^2 = .7551$$

deviations, positive or negative, which are designated as x and y to distinguish them from the original or raw data of the series, X and Y ; (3) each of the deviations is squared, and the totals of these squares are noted; (4) the cross-products of the deviations x and y and their total are noted in the column xy ; (5) standard deviations are calculated in

EXAMPLE 10
CORRELATION OF RAW DATA

Data: Same as that of Example 9.

Employee	Test Score X	Units Produced Y	X^2	Y^2	XY
A	40	2	1600	4	80
B	50	3	2500	9	150
C	60	3	3600	9	180
D	70	4	4900	16	280
E	60	6	3600	36	360
F	60	7	3600	49	420
G	80	8	6400	64	640
H	90	8	8100	64	720
I	100	9	10000	81	900
J	90	10	8100	100	900
Totals	700	60	52400	432	4630

Standard deviations:

$$\Sigma x^2 = \frac{n \Sigma X^2 - \Sigma X^2}{n} = \frac{10 \times 52,400 - 700^2}{10} = \frac{524,000 - 490,000}{10} = 3400$$

$$\Sigma y^2 = \frac{n \Sigma Y^2 - \Sigma Y^2}{n} = \frac{10 \times 432 - 60^2}{10} = \frac{4320 - 3600}{10} = 72$$

$$\sigma_x = \sqrt{\frac{\Sigma x^2}{n}} = \sqrt{\frac{3400}{10}} = 18.439$$

$$\sigma_y = \sqrt{\frac{\Sigma y^2}{n}} = \sqrt{\frac{72}{10}} = 2.6817$$

Cross Products:

$$\Sigma xy = \frac{n \Sigma XY - \Sigma X \Sigma Y}{n} = \frac{(10 \times 4630) - (700 \times 60)}{10} = \frac{46,300 - 42,000}{10} = 430$$

Coefficient of correlation:

$$r = \frac{\Sigma xy}{n \sigma_x \sigma_y} = \frac{430}{10(18.439)(2.682)} = 0.8690$$

(Least highly significant value, see Figure 38, Appendix H, is 0.77.)

the usual manner; (6) the value of r is obtained by substitution in the simple formula as indicated.

Example 10 illustrates an alternative method of arriving at an identical measure of correlation. It is particularly useful where calculating machines are available.

Evaluating measures of correlation. In most cases, a major purpose of correlation is discovery of the possible significance of the coefficient. In other words, the absolute measure of co-variation is not so important as is an answer to the question, is the relationship merely accidental? In modern practice the question is answered by reference to tables or charts such as Figures 37 and 38, Appendices G and H. The curve, $v = 2$, is always used in simple linear correlation. Figure 37 shows the least significant value. A value as great or greater would appear only once in twenty times by pure chance. Figure 38 indicates the least highly significant value under the given conditions. A value as great or greater would appear only once in one hundred times by pure chance.

Prediction based on correlation. It will be apparent that if there is a highly significant correlation between two series, then a knowledge of the value of an item in one will suggest the general position of the paired item in the other. If it is found, for instance, that there is a high correlation between scores on an admission test and later ratings, then the probable rating of an applicant who makes a certain score on the test may be forecast. In the terms of the data used in preceding examples, it is possible to estimate probable production from known test scores, and it is similarly possible to estimate the probable test score for a worker whose production is known.

Such prediction is most conveniently effected by use of what is known as a *regression line*. The line is commonly defined in terms of its algebraic formula as $T = a + bX$, where T is a point on the line, a is a measure of the height of the line where $X = 0$, b is the measure of slope in the line, and X is the known value. In order to locate the line, it is

necessary to discover values of a and b , after which the height or predicted value may be readily discovered merely by inserting the appropriate X -value in the equation.

The desired values are directly available from the data of the correlation process. The value of b is found first, as (for the regression of Y on X),

$$b_{YX} = r \frac{\sigma_y}{\sigma_x}$$

For the data of the example, b is found to be 0.1264. The value of a is then available as,

$$a_{YX} = M_y - bM_x$$

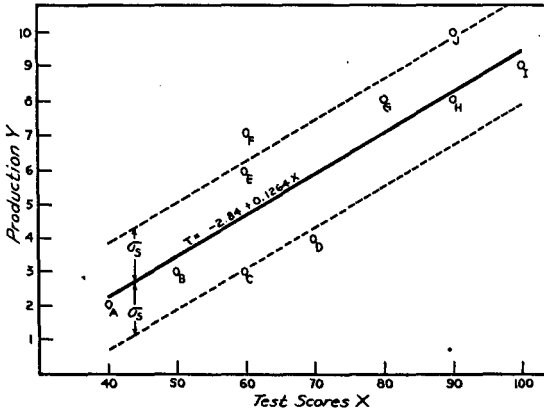


Fig. 16.—Graphic Estimation of Production from Test Scores. (Data: see Examples 9 and 10.)

In this case, a is -2.84 . The regression line is $T = -2.84 + 0.1264X$, and the predicted production for an applicant who scores 40 is $T = -2.84 + (0.1264 \times 40) = 2.216$. When any two points have been located, the entire line may be drawn, as it has in Figure 16. Then, prediction may be made either by substituting given X values in the regression

equation or by reference to the chart. Predictions should not be made beyond the range of the data upon which the regression line is based.

Reversing prediction. In some cases, it may be desired to reverse prediction, for instance, to predict probable test scores for employees whose production is known. In such

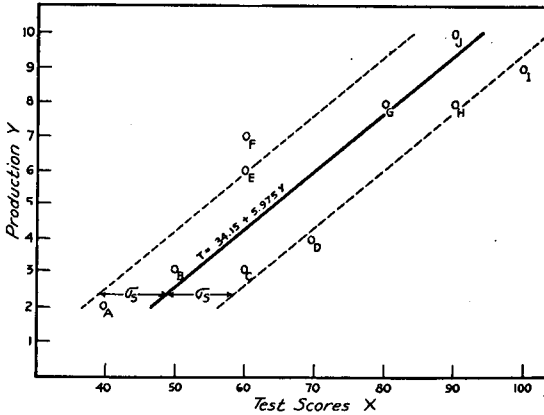


Fig. 17.—Reverse Prediction: Graphic Estimation of Test Scores from Production. (Data: same as Fig. 16.)

cases, a different regression line is necessary, and that line is defined by different values of a and b (the coefficient of regression). The value of the new b is discovered by reversing the positions of the standard deviations, so that

$$b_{XY} = r \frac{\sigma_x}{\sigma_y}$$

Similarly, the new value of a is found as,

$$a_{XY} = M_X - b_{XY}M_Y$$

The regression line is $T = a + bY$. For the data of the examples, the regression of X on Y , or regression of test scores on production, is shown in Figure 17. Prediction is

effected by substituting given values of Y in the regression equation or by reference to a chart of the regression line.

Reliability of estimates. It will be apparent that the reliability of such predictions depends on the degree of correlation between the two series. If correlation is high, prediction may be quite accurate; if it is only moderate, prediction or estimation must be highly approximate. It is customary to indicate these limitations on prediction by stating the *standard error of estimate* (symbol, σ_e). It defines the limits within which approximately two thirds of the estimates based on a given correlation may be expected to fall. It has been shown in Figures 16 and 17 by dotted lines on either side of the regression lines. It is measured as,¹¹

$$\sigma_e = \sigma_y \sqrt{1 - r^2}$$

Correlation is but one of several statistical tools that may be found highly useful in evaluating various selective devices. What is essential is the recognition of the fact that testing is never an end in and of itself, and that the same rule applies to other selective aids. All must be evaluated in terms of their effectiveness in selecting desirable employees, and that means that constant analysis of devices and their results is essential.¹²

Vocational guidance. Vocational guidance is not one of the functions of personnel administration that its exponents generally emphasize or seek to expand. Rather, it appears as an almost inevitable accompaniment of selection and placement. So little in the way of a scientific basis for vocational guidance is as yet available that no set procedure can be defined, and no claims to successful guidance can be

¹¹ Where data are limited in number and are regarded as samples of a larger universe, the standard error of estimate should be corrected for sampling errors, and the coefficient of correlation should be corrected in the same way.

¹² See, Bengt, E. J., "How to Prepare and Validate an Employee Test," American Management Association, *Proceedings of the Institute of Management*, No. 9, 1929; Kinney, Lucian B., "The Relation of Certain Factors to Success in Clerical Positions," *Journal of Applied Psychology*, January, 1933, Vol. 17, No. 1, pp. 55-63.

reasonably made as far as industrial and commercial personnel activities are concerned. The fact is that vocational guidance is an inescapable feature of selection and placement, that those who assign workers to positions by so doing exert a considerable influence upon future vocational choices, and that, for that reason, it is desirable that all personnel officers strive to keep abreast of developments in the field of vocational guidance.

It is probable that the most effective guidance at the present time is that being undertaken by public schools and colleges and universities. Although considerable attention has been given to the subject since Professor Frank Parsons of the Boston University Law School organized the Vocational Guidance Bureau of Boston in 1908, few definitive conclusions have been developed as to desirable procedures, and much remains to be done before any positive program can be outlined. The National Vocational Guidance Association was organized in 1913, and a magazine, first known as the *Vocational Guidance Magazine*, and since 1933 called *Occupations*, was established in 1915. A great deal of investigation, study, and promising research is under way in a variety of institutions. Meanwhile, however, quack doctors who promise impossible results flourish in many localities.

The basic problem of vocational guidance involves the determination of the characteristics essential to success in various occupations and the discovery and measurement of these features as they are present in greater or less degree in different persons. The second of these problems, that of evaluating the individual, is closely akin to that regarded as basic to any successful selective program. The first, the determination of human characteristics requisite to success in different occupations, requires for its maximum value something similar to a job analysis for all types of positions and occupations throughout the length and breadth of the modern economic organization. Personnel divisions can assist in providing these job analyses. They can help the

whole field of vocational guidance by improving existing knowledge of the human characteristics necessary to success in various jobs. And they can further assist by providing authorities charged with responsibility for vocational guidance with information as to changes, technological and otherwise, that will redefine such characteristics. Beyond these contributions, they probably cannot go, for few if any of those charged with responsibility for personnel policies can expect to qualify, at the same time, as experts in vocational guidance.¹⁸

Introduction and follow-up. It is becoming increasingly common, in modern business, to make definite provision for the introduction of new workers to their fellows. Many business organizations have instituted a sort of sponsor system, whereby new workers are taken in hand by one well acquainted with both work and workers and are thereby properly introduced and made to feel that they are recognized and are welcome. Sponsors are selected carefully, and the assignment is made a matter of honor and credit to the individual chosen to act in that capacity.

Once workers are selected and placed on the job, it is clear that only the most obvious phases of the selective process are complete. It is highly important, both from the standpoint of effective placement and as a means of checking on selection, that placements be followed up. Most personnel divisions find it necessary for this purpose to have a systematic checkup at regular intervals following placement. Generally, such a checkup involves regular reports on newly employed persons from their foremen and department heads as well as periodic interviews with the new employee. The

¹⁸ See, Earle, F. M., *et al.*, *Use of Performance Tests of Intelligence in Vocational Guidance*, London, Industrial Fatigue Research Board, Report No. 53, 1929; Strong, E. K., "Interests of Engineers: A Basis for Vocational Guidance," *Personnel Journal*, April, 1929, Vol. 7, No. 6, pp. 441-454; McCabe, Martha R., *List of References on Vocational Guidance*, Washington, U. S. Bureau of Education, 1929; Stott, M. B., "Vocational Guidance and Training for the Girl," *Human Factor*, May, 1937, Vol. 11, No. 5, pp. 166-173; Rainey, Homer P., "Guidance and Placement for America's Youth," *Occupations*, June, 1937, pp. 838-844.

whole value of the selective program may well depend upon the thoroughness with which this revaluation process is undertaken, and most of the criteria by means of which interviews, references, and tests may be evaluated can be derived only from such a systematic follow-up on placements.

Exercises and Problems

1. Prepare a brief abstract or summary of one of the articles mentioned in footnotes throughout the chapter.
2. Management has tried an admission test on all applicants for employment in a certain division over a considerable period of time. It seeks to evaluate the possible correlation between performance on the test and on the job, and it wishes, also, to consider the possible relationship between age and performance on the job. Analyze the following sample of the available data, limited for classroom purposes:

<i>Employee</i>	<i>Test Score (X_1)</i>	<i>Age (X_2)</i>	<i>Average Monthly Sales (in \$1000) ($Y$)</i>
a	90	30	10
b	85	40	7
c	70	45	4
d	75	50	2
e	80	35	6
f	75	30	4
g	80	35	8
h	70	50	6
i	95	25	9
j	100	20	9

- (a) Discover the ranking coefficients of correlation for both relationships.
 - (b) Discover the Pearsonian coefficients for both relationships, and evaluate them by reference to the charts in Appendices G and H.
 - (c) Prepare regression equations for each of the relationships, and chart them, showing the standard error of estimate.
 - (d) Estimate sales for a test score of 82; for an employee 31 years old.
3. Management desires to discover the possible relationship between scores made in the final examination of a training course and previously earned high school grades, with the idea that high school performance may prove worth while as a means of selecting employees for training courses. Analyze the following summary (reduced for problem purposes) to discover:
 - (a) the ranking coefficient of correlation,
 - (b) the Pearsonian coefficient of correlation,
 - (c) the estimating equation,
 - (d) the standard error of estimate.

Selection (Continued)

Evaluate the significance of the coefficient by reference to the charts in the appendix, chart the relationship, and estimate the probable grade of a student whose high school percentile rank is 80.

<i>Trainees</i>	<i>High School Percentile rank (X)</i>	<i>Training Course Grade (Y)</i>
a	100	95
b	95	95
c	90	100
d	85	75
e	85	85
f	80	70
g	75	50
h	70	55
i	65	40
j	60	60

4. Management wishes to evaluate the possible co-variation of admission test scores and ratings secured by the same individuals after they have been employed for a considerable period of time. Data are summarized below. Calculate the coefficient of correlation, the predicting equation, the standard error of estimate, and chart the relationship. Estimate a rating for an applicant who scores 80 on the test.

<i>Admission Test Score</i>	<i>Rating</i>	<i>Admission Test Score</i>	<i>Rating</i>
67	80	78	94
76	70	75	82
66	74	92	66
99	83	99	98
94	79	78	78
85	75	58	78
80	91	88	94
92	82	80	73
79	77	82	75
71	86	98	81
83	89	70	56
94	94	88	94
100	100	98	97
75	77	79	82
98	93	82	86
85	86	79	81
82	81	81	77
89	93	74	72
93	88	74	81
75	83	97	93
91	95	75	74
77	79	95	97
100	91	62	65
89	82	81	70
72	75	97	91
84	87	79	89
98	89	94	92
86	93	81	68
87	89	71	77
88	92	71	84
91	90	75	78

<i>Admission Test Score</i>	<i>Rating</i>	<i>Admission Test Score</i>	<i>Rating</i>
79	78	79	76
77	79	82	84
86	82	91	93
94	85	65	74
81	67	91	82
77	76	82	73
84	77	99	90
91	83	80	78
93	87	81	81
83	96	77	79
87	83	74	74
79	76	95	93
60	65	80	82
90	88	65	68

Collateral Reading

(Note classified references in footnotes throughout the two chapters.)

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CHAPTER IX

Education and Training

NO matter what types of personnel problems may appear to be most important to management at any particular time, the one almost universally suggested method of attack on them is more and better training. In industry, as in society generally, education is the great panacea; and training is counted upon to perform miracles in many cases. It is expected to increase production efficiency, both in the sales-room and on the production line, a result that it can frequently attain. It is called upon to reduce the problems arising out of necessary disciplinary measures, to restrict tardiness, absence, stalling, and even less desirable practices of employees. It lays a basis for programs to reduce accidents and improve workers' health. It seeks to school employees in dealing with the public, to teach them courtesy, poise, and salesmanship. In some cases, it aims to provide them with a broad, general knowledge of American social and political life, thus aiding them in becoming citizens or in participating more effectively in the duties of citizens. And it is constantly called upon to interpret to workers the managerial policies of the organization, to the end that coöperation may be improved and such policies made as effective as possible.

All this should indicate rather clearly that the training and education of employees is not a simple problem. It involves not one but several types of education, types that are necessarily as varied as are their purposes.

Training in public schools. It is frequently suggested that industry should not have to provide much specialized training for workers, that such training should be provided

by the public schools. Certain it is that the public school systems of many European nations provide much more extensive vocational education than is generally available in this country. In Germany, the trade school is said to have been begun some two centuries ago, with the establishment of such an institution at Holle by Semler in 1706. The movement received active support from the government of Frederick the Great and has become firmly entrenched. France, also, began experimentation with vocational education early in the 19th century, and a well coordinated program developed rapidly after the midpoint of that century. In all the major industrial nations of Europe, considerable proportions of the population are enrolled in public industrial training courses. Thus, in 1930, 2.21 per cent of the population of London was so enrolled, as was 5.26 per cent in Manchester, 8.59 per cent in Edinburgh, 4.85 per cent in Glasgow, 4 per cent in Munich, 6.28 per cent in Zurich, and 8.08 per cent in Newchatel. In contrast, 0.67 per cent were so enrolled in Boston, 0.23 per cent in Chicago, and 0.12 per cent in Detroit. Canada has taken steps modeled somewhat after those prevalent in Europe.¹

In the United States, a program of vocational training in the public schools has long been eyed with suspicion by many citizens, some of whom regard such a development as opposed to the open-class system. They fear that workers' children may be encouraged or possibly forced to undertake training for vocations rather than to prepare themselves for more extended education. In recent years, however, this opposition has become less common; and, beginning with enactment of the Smith-Hughes Law of 1917, the federal government has sought to encourage vocational education by offering to match state funds used for that purpose. The

¹ See, "Vocational Education in Various Foreign Countries," *Monthly Labor Review*, January, 1935, Vol. 40, No. 1, pp. 92-99; "Recent Vocational Training Activities in Foreign Countries," *ibid.*, November, 1935, Vol. 41, No. 5, pp. 1269-1274; Struck, Ferdinand Theodore, *Methods and Teaching Problems in Industrial Education*, New York, John Wiley & Sons, Inc., 1929.

original act appropriated seven million dollars annually for training in agriculture, home economics, and unspecified trades, industries, and commerce. In the period of recovery from the recent depression, when it appeared that many of the millions unemployed were also unemployable, the George-Ellsey Act of 1934 increased available federal funds to ten million dollars annually, and the George-Deen Act of 1936 further increased the amount to \$14,483,000.

This legislation is in large measure responsible for a recent distinct increase in the number and variety of training courses now available as well as the number of students enrolled in such courses. The 1930 *Directory of Trade and Industrial Classes in the United States* lists 225 different courses under public control and exclusive of the extensive training provided by private vocational schools. All the forty-eight states are now participating in such training. The *Directory* indicates a total enrollment in 1930 of some 1,125,000 students, of whom only 300,000 are accounted for by courses in agriculture. Among the most popular evening courses are those in sheet metal, steam fitting, plastering, welding, and related trades; and others provide training for policemen and firemen.³

Reports of state boards for vocational education indicate that there were, in the 1935-1936 school year, 1,381,701 students enrolled in vocational schools or classes operated under state plans. The number indicates an increase of 134,178 over the previous academic year. Of the total number, 347,728 were students of agriculture, 454,002 studied home economics, and 579,971 were enrolled in trade and industrial classes. Numbers of enrollments have increased fairly steadily since 1929, when the total enrollment was 1,047,976. In the same period, the totals of federal, state, and local ex-

³ See, Lee, Edwin A., editor, *Objectives and Problems of Vocational Education*, New York, McGraw-Hill Book Company, Inc., 1928; Mays, A. B., *The Problem of Industrial Education*, New York, D. Appleton-Century Company, Inc., 1927; *Digest of Development of Industrial Education in the United States*, Washington, Federal Board for Vocational Education, 1933.

penditures for such education increased from some \$27,000,000 annually to \$33,000,000.³

In spite of these developments, the public schools do not and probably can not provide the training needed for workers in industry and business. Many students graduate from such schools, or quit before graduation, without knowing what occupation they wish to enter. Moreover, the problems of business training are too diverse to be adequately cared for in any public school system. About all that can be hoped for is training for a comparatively few well standardized types of positions.

Correspondence courses. Meanwhile, workers have, in many cases, sought to secure needed vocational training by enrollment in correspondence schools. The results are, in the aggregate, far from satisfactory. A recent report of a study made in the Minnesota Employment Stabilization Institute probably presents a fair cross section of workers' experience with such training. The report concludes as follows:⁴

The general question of adult education leads naturally to a consideration of the effectiveness of some of the existing agencies that provide such education. From the case histories collected on men and women in the Occupational Analysis Clinic, it was possible to select a group of 197 unemployed men and 108 employed men who were or had been enrolled in commercial correspondence courses. A detailed study of these histories was made to determine whether or not advertised claims were verified in practice.

Of the 235 men, 40 per cent gave up before the end of the year, and about 75 per cent had dropped out by the second year. Only 6 per cent finished their courses. The mortality rate is thus shown to be 94 per cent. It is high among both employed and unemployed. It would seem that commercial correspondence training is far less efficient than advertised claims would lead one to expect.

Careful analysis of the case histories indicated that a considerable proportion of these men were attempting forms of training far beyond their capacities. A very large number of men employed in semiskilled and unskilled occupations were found to be paying fees for courses in

³"Vocational Education and Vocational Rehabilitation, 1935-36," *Monthly Labor Review*, June, 1937, Vol. 44, No. 6, pp. 1432-1435.

⁴Paterson, Donald G., and Darley, John G., *Men, Women, and Jobs*, pp. 53-54. Minneapolis: University of Minnesota Press, 1936.

accounting, business management, and engineering. Many of them could profit far more from less difficult training directly related to their jobs. In only a few instances were men in the lowest occupational levels found to be qualified to study for higher level jobs. In general, it should be apparent to an unbiased observer that training in accordance with careful diagnosis would be more effective than training on the basis of ambition alone, no matter how well-intentioned one's ambitions may be. Medical treatment on the basis of a doctor's diagnosis usually effects more cures than ordinary patent medicine "doctoring". The analogy in the field of adult education need not be labored. If commercial correspondence schools would use available personnel methods in guiding adult students into suitable courses, their training would fill a distinct need in adult education. Until they use such methods, however, their intensive advertising and sales campaigns must brand them as primarily profit-making institutions. Actually their profits come in the majority of cases from dissatisfied and unhappy people whose failure in the new attempt still further increases their feelings of inadequacy and insecurity.

Industry's need for training. The possible uses of training within industry have been suggested in opening paragraphs of this chapter. There are numerous personnel problems in which training appears as essential to satisfactory solutions. Moreover, industry can readily justify some expense for training, for it offers genuine opportunity for managerial economics. By providing a better understanding of the nature and policies of the organization as a whole, it improves morale and coöperation. By reducing labor turnover, accidents, absences, and tardiness, and by improving the quality of work performed, it tends to lower unit labor costs. It facilitates discovery and recognition of promotional material among employees; and additional values, perhaps less obvious but equally as significant, are advanced by effective training.

In many cases, management hesitates to accept responsibility for training because experience indicates that many employees accept the training and are then employed by competitors who have no such program. For this reason, management concludes, training should be provided by public educational institutions. The reality of this condition cannot be denied, but it can be as certainly insisted that such employees should seldom be more valuable to com-

petitors than to the organization which provides the training. Moreover, many managements now require trainees to sign agreements involving what is known as a "radius clause," by which they contract not to leave the firm and join a competitor within a specified period.⁵

Types of training required. It was indicated, in earlier paragraphs, that industry needs several types of training, and it may be well, at this point, to distinguish the most important of these. Probably the most commonly required is what is generally described as job training, that is, training designed to qualify semiskilled or unskilled employees for particular jobs or positions. Such workers may be new to the firm or they may be workers of longer tenure whose former jobs are being discontinued. For more highly skilled workers, training needs approximate what is generally described as apprenticeship, or training in craftsmanship. A somewhat different training is required for direct labor management or foremanship. More complicated and inclusive is the training that must be provided for those who are to assume executive positions, executive training. Finally, there is much special purpose training, including Americanization courses (less important now that immigration is restricted), safety and accident prevention programs, and training in public relations. Commonly used methods of providing each of these types of training deserve more extensive treatment.

Job training. Two principal methods of job training are in use. One of them, usually described as training on the job, simply places the worker in the workroom and provides supervision while he learns to master the operations involved. Generally, such training provides supervision by means of some sort of sponsorship arrangement, whereby an older employee is charged with responsibility for instructing the newcomer and assisting him in mastering the job.

⁵ See, *International Labour Review*, March, 1929, Vol. 19, No. 3, pp. 402-415.

Sometimes, training on the job is supplemented by instruction of a classroom nature, and the proportions of the two types of training are widely varied from job to job.

In larger business organizations, it is frequently found to be more satisfactory to provide what are described as *vestibule* schools, because they are preliminary to actual shop experience. In them, shop conditions are, as far as possible, duplicated, but work is not regarded as of paramount importance. Rather, the major purpose is instruction, and special instructors are provided.

The question as to which type of training is most satisfactory can be answered only by reference to the individual firm. Generally, smaller firms cannot afford to provide either the facilities or the instruction required for vestibule schools. Many other considerations must be taken into account. Training on the job interferes with regular shop routine. In many cases, it is undertaken under adverse conditions with respect to noise and interruptions. Much will depend upon the length of the required learning period, the wage payments that must be made during that period, the value of raw materials or machines that may be injured if the novice is put on regular production, the possibility of industrial accidents, and the number of initiates to be trained.

Investigation of job training by the Minnesota Employment Stabilization Institute indicated that firms were equally divided, in number, between those who used training on the job and those who used vestibule schools. But about three times as many employees were trained in the vestibule schools, indicating that the latter were characteristic of the larger firms. In retailing, on the other hand, training on the job appears to be almost essential, and that is also true in numerous less prominent occupations.

Whichever method may be selected, the content of the training course may best be determined from the results of the job analysis. The latter should indicate clearly the es-

sential features of the job, and job training should result in familiarity with those features and with the most efficient manner of performing the operations involved.⁶

Craftsmanship training. Training for craftsmanship involves preparation, not for a single job, but for the many types of jobs that may be given to a tradesman or craftsman. Its extent and intensity vary greatly among the crafts, but such training may be said generally to require a knowledge of some theory, some mathematics, the ability to read blueprints and specifications, a familiarity with and skill in the use of the usual tools of the craft, and a period of internship or apprenticeship, in which this knowledge and skill are checked and supplemented by supervised practice.

Some fifty or sixty crafts have well-established apprenticeship requirements. They specify certain periods of service as assistants to journeymen, in which the novice is expected to master the theory and practice of the craft. Some of these trades have what is known as indentured apprenticeship, with periods extending for 2 or 3 years and a definite contract providing for wage advances at regular intervals throughout the period. In other trades, generally those having shorter apprenticeship periods, no such indenture or contract is provided. The latter condition is true, for instance, of carpenters, millwrights, and tinsmiths. According to the Census of 1930, there were 92,000 apprentices in all the skilled trades in the United States, as compared with a total of 6,000,000 skilled workers, and many of those listed as apprentices were really helpers or machine tenders.

⁶ See, as illustrating job training for various occupations, Dennison, H. S., and Kier, John S., "Selection, Assignment, and Training of Workers," *Personnel Journal*, August, 1930, Vol. 7, No. 2, pp. 42-51; LaChance, H. C., "The Training of Telephone Operators," *Bell Telephone Quarterly*, January, 1931, Vol. 10, No. 1, pp. 12-16; Dildene, Paul L., "They All Go to School," *Factory Management and Maintenance*, April, 1935, p. 159ff.; Lange, W. H., "Regaining Lost Skill," *Personnel Journal*, June 1935, pp. 210-215; National Safety Council, *Training Drivers for Commercial Vehicles*, Chicago, 1930; Osborne, David R., "Training Salesmen in the Studebaker Corporation of America," *Personnel*, August, 1929, Vol. 8, No. 2, pp. 53-64; Lawson, Bevan, "Recruiting and Training the College Man for Selling," *Personnel*, February-May, 1932, Vol. 8, No. 3-4, pp. 120-127; *Training New Salesmen*, Chicago, Dartnell Corporation, 1932.

The system of apprenticeship, controlled by members of the craft, dates from the period of the guilds. It has many deficiencies, as far as its use in the present industrial order is concerned. Generally speaking, specified periods are longer than is necessary for the mastery of the trade if efficient training methods are used. The specification of an arbitrary apprenticeship period fails entirely to recognize individual differences in learning ability and results in justifiable resentment upon the part of adept newcomers in the field. In many cases, the system has been used by trades that are effectively unionized primarily as a means of restricting the supply of workers, rather than as an effective means of training. The craftsmen who are assigned as sponsors of apprentices may or may not be effective teachers, so that the time of apprentices is frequently poorly used. Moreover, the craftsmen may not give as much attention to their training responsibilities as the latter require.

On the other hand, employers have frequently condoned the system and used it to their own advantage. Thus, they have had new employees held to their apprenticeship status so that they could be employed at low wages. They have so arranged work that journeymen could not devote sufficient time to instruction, and they have not insisted upon assurances of journeymanship as a requisite of employment, with resulting disorganization of the whole system in some trades and localities.

The shortage of skilled craftsmen in the midst of extensive unemployment has long been a commonly encountered difficulty in the United States, and as early as 1910, several states began legislation calculated to encourage more systematic and effective apprentice training. The Wisconsin law of that year was followed by numerous similar acts in other states, and, under the general program of the National Recovery Administration, a presidential executive order authorized the Secretary of Labor to set up an extensive series of committees to coordinate a nation-wide apprentice-training program. Three types of committees were created,

including (1) a Federal Committee on Apprentice Training; (2) state committees on apprentice training in each state, composed of representatives of organized labor, employers, the state department of labor, state board for vocational education, and the public employment service; and (3) trade advisory committees composed of employers and workers in the various organizations. The federal committee has as its major purpose the development of training programs throughout the nation. State committees are charged with responsibility for general supervision of such plans as may be instituted within their jurisdictions, and they grant diplomas to those who successfully complete training. The trade advisory committees guide state committees in determining specific policies as to the length of apprenticeship periods, numbers of apprentices allowed individual employers, and other such details.⁷ The federal committee was given a permanent status in the Department of Labor by law in 1936.

The new national program seeks to provide for written contracts or indentures specifying the kind of training to be given, the length of the apprenticeship, hours to be devoted to training on the job and in the classroom, and wages of apprentices. Certain minimum standards are required, of which the most important provide that (1) an apprentice must be at least 16 years old; (2) apprenticeship shall include not less than 2,000 nor more than 10,000 working hours, (3) at least 144 hours per year must be devoted to group instruction under public authorities, (4) beginning wages must be not less than 25 per cent of those paid journeymen, and the average wage paid for the whole apprenticeship period shall be not less than 50 per cent of journeymen's wages. The new arrangements provide for close

⁷See, *An Explanation of the Organization, the Administration, and the Objectives of the Program of Apprentice Training*, Washington, Federal Committee on Apprentice Training, Bulletin No. 2, 1935; *What the Federal-State Apprentice Training Program Means to Employers*, Washington, Federal Committee on Apprentice Training, Bulletin No. 1, 1935.

coöperation between the crafts and industry, and it is to be hoped that they will provide an adequate supply of craftsmen in the not too distant future, for craftmanship training is too expensive to be undertaken by most individual concerns without such coöperation.⁸

Foremanship training. The training of foremen has been the subject of much special attention in recent years, largely because of a growing recognition of the fact that the foreman's position is a key one in many organizations. Foremen have direct contact with the personnel of the organization; they administer the policies decided upon in managerial conferences; and they can readily injure the most carefully planned program if they are not properly prepared for the responsibilities of their position. Accordingly, recent years have seen great attention directed to foremanship training, and genuine improvement in usual methods has resulted. The investigation made by the Minnesota Employment Stabilization Institute disclosed that 62 of the 690 business establishments included in this study provided training for foremen and supervisors.

There are several fairly standardized types of approach to the foreman-training program. Many firms, for instance, have found arrangements providing for "flying squadrons" effective. The plan was first effected by the Goodyear Tire and Rubber Company in 1913, with an initial group of twenty men. Under such arrangements, employees are moved about among departments, familiarizing them with the general organization and with managerial problems and policies in various departments. The system is essentially one of job rotation and is so designated in some cases.

The content of the training course for foremen necessarily

⁸ See, Hull, Hernian S., *Trade Training in School and Plant*, New York, D. Appleton-Century Company, Inc., 1930; "Vocational Training in Industrial Plants," *Monthly Labor Review*, March, 1936, Vol. 42, No. 3, pp. 650-654; Scrimshaw, Stewart, *Apprenticeship; Principles, Relations, Procedures*, New York, McGraw-Hill Book Company, Inc., 1932; *Wanted, Skilled Labor*, New York, National Industrial Conference Board, 1935.

varies, with most common emphasis upon safety instruction, principles of coöperation with employees, and good housekeeping, including especially the care of machinery and equipment, the reduction of waste, and the introduction and training of new employees. It may well include careful consideration of basic managerial principles, such as scheduling of production, cost and quality control, and an extensive discussion of all phases of personnel management. It is well to bear in mind that foremen are direct personnel managers. Their understanding of labor policy throughout the organization and of the principles involved in the personnel program as a whole is essential to the success of that program.

There is general recognition of what is described as "cold storage" training in preparing employees for foremanship, the idea being that much of the training may not become usable for some time, that it must be regarded as an inactive investment on the part of employers until such time as it becomes useful.

Both lectures and conferences are generally utilized in foreman-training programs, although emphasis seems to have favored the conference method in which ideas and problems are discussed by those who are taking the training program. Preference for conferences as opposed to lectures is based upon the necessity of developing leadership among foremen, a result that is best attained where they are encouraged to express their ideas in open forum. The conference method requires a great amount of time, however, and it is difficult to find good leaders. In some cases, facilities of the public schools are utilized to provide classrooms, and continuation courses in such schools may be found valuable.

Often, management finds it worth while to prepare special texts, generally in mimeographed form, for foreman-training courses. Such texts may be written by department heads and other executives, or they may be prepared by those responsible for training. In any case, it is well to

allow for extensive additions to be made as a result of training conferences, for discussion there is likely to result in valuable contributions to the textual material. Generally, texts are prepared in the form of units, each such unit being designed for one or two conferences.

A closely related method of training foremen, popularized by C. R. Allen in his work with the Emergency Fleet Corporation, is sometimes referred to as the project method. It is essentially a case method, in which each conference is given over to consideration of a case typifying the problems of supervision. It is one effective means of awakening and maintaining interest in the foreman-training program. In other instances, foremen are trained by a method which makes them in effect vice-foremen or understudies for those already in these positions.

In the Minnesota study, 11 firms with 17,800 employees out of the total of 62 firms having training for foremen and supervisors utilized a flying squadron; 16 firms with 78,250 employees depended upon meetings and the conference method; 9 firms with 103,400 employees used the understudy method; 6 firms with 40,907 employees placed major dependence upon instructional manuals; and 30 firms with 306,150 employees provided special classroom instruction.

There appeared to be a tendency on the part of management, in the years directly following the World War, to conclude that foremen were destined to become increasingly unimportant as management came to assume the responsibility for planning, routing, and making all important decisions as to policy. The weaknesses of such a point of view were, however, quickly apparent, and recent years have seen a growing emphasis upon the careful training of foremen. That emphasis has been augmented by the growth of managerial problems attendant upon industrial expansion and reemployment in the period of economic and industrial recovery.⁹

⁹ For more detailed discussions of foreman training methods, see, Mellen, George F., *Foreman Training*, New York, McGraw-Hill Book Company,

Executive training. Many firms have discovered that the only way to secure satisfactory executives is to train them. They cannot be provided merely by the accumulation of good material. Neither can they be gathered, ready-made, from colleges and universities. And, finally, there are limits to the numbers of such officers who can be hired away from other organizations or expected to forge their way up from the ranks by accident and an indomitable will for advancement. Accordingly, many organizations make definite plans to provide executives as they are needed, and training for executive responsibilities is an essential feature of all such plans.

Formal executive training programs are generally said to have originated with a sort of experimental arrangement undertaken by the General Electric Company in 1892. The York Ice Machine Company began visiting colleges and universities to secure material for its courses in 1913, as did the Goodyear Tire and Rubber Company. Other firms followed the precedent thus established, and, although the early years of the depression caused some of them to restrict such employment, the years of recovery necessitated even more extensive efforts to secure material of an executive type so that increasing numbers of firms now canvass institutions supplying such material each year.

The courses of training for executives are generally more inclusive than those provided for any other group or purpose. They frequently include the job rotation or "flying squadron" feature employed in training foremen, but they require longer periods (from a few months to several years, commonly two or three years), and they make use of lectures, conferences, textbook study, and many of the usual features of formal education. In some cases, tuition is charged as a means of restricting entrants to those who seriously contemplate a long experience with the organization.

Inc., 1928; "Report of a Training Course for Foremen Conference Leaders," Washington, Federal Board for Vocational Training, June, 1932; "Report of the Supervisor's Division of the Silver Bay Industrial Institute," Washington, Federal Board for Vocational Education, 1932.

Regular examinations are customarily provided, and courses may include such subjects as accounting, corporation finance, marketing, business law, business statistics, industrial relations, and others. Not infrequently executives are called upon to deliver lectures and lead discussions; and regular, full-time instructors, properly qualified to teach the subjects with which they deal, are often employed for that purpose.

Much of the success of such programs depends, of course, on the careful selection of executive material from within as well as without the ranks of employees. Many firms restrict entrance to the executive training program to young men just out of college. Others depend almost entirely upon promotion from the ranks. In general, it appears that smaller firms tend to go outside their own ranks and employ executives trained by others, while larger firms provide their own training.¹⁰

Special purpose courses. Many firms have found training courses for special and limited purposes desirable. Most common of such programs are those intended to reduce accidents, and others have sought to familiarize employees with the far-flung activities of the concern or with managerial policies, or have been intended for other similar purposes. Where large numbers of recent immigrants are employed, management has sometimes sought to assist them in preparing for citizenship by providing so-called Americanization training, including courses in civics or government, American history, and related fields. Many workers have objected to such courses, accusing them of being little more than paternalistic efforts to control workers' attitudes and enforce an attitude of subservience and submission. While such criticisms may be and doubtless are valid in cer-

¹⁰ For more detailed discussions of executive training, see, Schell, Erwin H., "Education and Training of Personnel Suitable for High Administrative Positions," *Taylor Society Bulletin*, September, 1935, pp. 197-199; Metropolitan Life Insurance Company, "Training Plans for Junior Executives," New York, 1939; Langley, R. W., and Edwards, J. R., "Training and Selection of Workers," *Society for the Advancement of Management Journal*, March, 1936, p. 6f.

tain instances with respect to Americanization programs, the same certainly cannot be said of safety training and other similar courses.

Educational devices and techniques. All formal educational programs make use of certain well-established educational techniques and devices, and much informal education, in addition to that provided by formal training courses, may be accomplished by the judicious use of some of these devices. For instance, many firms provide all employees with a handbook explaining management's policies and established practices. Similarly, company libraries may assist workers in self training, and lecture series may aid in interpreting the concern's activities and policies to all employees and in giving the latter a conception of the part they play in the broader aspects of the business as a whole.

Bulletin boards are a constantly available educational medium and are especially effective in programs designed to advance health and safety. The plant magazine is another convenient and sometimes effective educational medium. Conferences and group meetings are frequently used for all types of training, and exhibits and displays may prove effective supplementary facilities. In some cases, suggestion systems may be used in educational programs. Sometimes arrangements are made with public schools or private vocational training schools to provide extension courses.

Training principles. The first task in establishing any effective training program is the determination of its objectives. Training needs may be determined by reference to job descriptions or by interviews and questionnaires directed to both executives and workers and intended to discover what they think a training course should attempt to accomplish. Attention may be directed to the training courses of other concerns, and training needs may also be discovered by analysis of production or sales records. In retail stores, professional shoppers may be employed to check up on service and discover its shortcomings; and in manufacturing, inspectors and checkers may provide similar information.

Upon the basis of the needs for training thus discovered, the training program may be outlined, and preliminary steps designed to put it into effect may be taken. Attention will have to be given to the selection of those who are to receive training. In some cases, all employees, or all new employees may be trained. In others, only those who appear likely to gain most from it may be included. Ratings may be used to identify such candidates, or interviews and questionnaires may be employed to disclose the most likely prospects. The job description catalog will furnish a clue as to various types of employees whose common tasks fit them for joint participation in such a program. Various types of tests, including intelligence, special aptitude, and proficiency tests, may help in the selection of trainees.¹¹

At the same time, it will be necessary to plan a curriculum based on the training needs already discovered. Analysis of shortcomings and of difficulties will supplement the information already available from job analysis on this point.

A next step is the careful selection of instructors to be used in training. It should be clearly understood that excellence of performance on the job does not necessarily guarantee any ability as an instructor. If formal lectures or conference leadership is expected, it will generally be found essential to secure trained instructors or else to provide special training for those selected as leaders. If executives are to instruct, a means whereby those who are unsuccessful may be tactfully eliminated from the program is an essential feature.

If instructors are to be trained, they may be given actual practice teaching in which they try out their techniques on their fellow instructors. They should be thoroughly familiar with the values of graphic presentation and with the simpler classroom techniques.

Finally, in instituting the training program, it is essential

¹¹ See, "Training Problems and Personnel Problems in Industry," *Personnel*, November, 1935, Vol. 11, pp. 176-183.

that its introduction shall be favorable. Its purposes and values should be carefully and thoroughly interpreted to all employees, both those who are and those who are not to participate. The program should not be undertaken until it is certain that key men in the departments affected will voluntarily cooperate. The program may well be confined, in its early stages, to new employees or to those who are being prepared for promotion. It will generally be found much more difficult to secure successful training results with older employees than with newcomers to the organization. Furthermore, some incentives to successful participation in and completion of the training program are essential. Frequent tests, carefully graded and returned, will help much in this connection as will diplomas, certificates, or other evidences of successful completion of the course.

Maintaining the program. It will be found worth while to provide frequent examinations in order that trainees may be provided with the stimulus such tests occasion. Various means may be used to combine the scores made on such tests in providing a final grade on the course, but the essential consideration is the maintenance of active interest. For that reason, it is desirable that future scores be always relatively more important than those already made, a result obtainable by emphasis upon some sort of final examination. Generally, it will be found that raw scores may simply be added to provide the total score. Sometimes comparison of individual scores is encouraged by graphic portrayal of all scores in a prominent position in the classroom. In others, group scores for departments or divisions may be so compared.

Many types of tests are used in training courses. So called "subjective" or essay type questions are most common, although objective types of examinations are gaining in popularity. The latter type of test has one great advantage; it can be accurately scored, while scoring on subjective questions is subject to serious criticism, and the latter is nearly always well founded. On the other hand, good ob-

jective tests are much more difficult to prepare. One of the most satisfactory procedures, as far as examinations are concerned, is that in which those who are responsible for the training program sit as an examination committee and jointly prepare questions to be used in examinations. Such an arrangement takes a great amount of time and effort, but good questions may be effectively used many times over, while poor questions are worse than useless.

Evaluating the training program. Like every other feature of industrial relations, the training program requires constant evaluation to discover how well it is performing the task assigned to it. Several methods of evaluation are possible. Probably the most positive of such checks is comparison of the training group with a control group of similar persons that is not securing the benefit of the training. No illustrations are given here, but some of the exercises at the end of the chapter illustrate the nature and usefulness of such comparisons. Allowances must be made, of course, for individual differences, if numbers are small. Another method of checking on the value of training is a comparison of production, sales, or other measures of performance before and after training, and some idea of the benefits of training may be gained by comparison of scores on examinations with a definite criterion of success, such as performance records.

The general principles involved in such a checkup may be simply stated. Every possible comparison should be made between trainees and non-trainees, and between performance before and after training or in the course of such education. Common sense may well be combined with all available statistical tools in evaluating the results of these comparisons.¹²

Statistical analysis. As has been suggested, some kind of tests or examinations will be found rather essential in almost all training programs, and it is highly important that such tests accurately measure accomplishments in the

¹² See, Green, J. H., "How Can the Efficiency of Training Programs be Evaluated?" *Personnel*, August, 1935, Vol. 12, No. 1, pp. 133-135.

course. Inappropriate, poorly prepared, and unfairly scored tests may readily defeat many of the most important purposes of the course if they encourage listless attention or dissatisfaction with marks. For that reason, it is highly important that the tests be carefully evaluated to discover how well they perform the task assigned to them.

A primary question with respect to any test concerns its reliability, that is, the consistency with which it measures whatever characteristic it is designed to measure. Obviously, if there is little consistency, the test is undesirable for that reason. Several means of arriving at a measurement of the reliability of a test are available. The test may, for instance, be repeated, after a time, with the same group of students to discover how closely results compare. It is obvious that such comparisons have weaknesses, for changes in the attitudes and attainments of individual students will affect the results. Generally, the scores of individuals in the two experiences are correlated, and a coefficient of correlation, or in this case, of reliability, of about 0.80 is desirable if the test is to be regarded as satisfactory.

Probably the most generally used method of evaluation is that described as the split-test method, especially if the test is composed of a fairly large number of questions. According to this procedure, the test is divided into two equal parts. This result may be obtained in any convenient manner, although that generally favored separates odd-numbered and even-numbered questions, on the theory that such an arrangement most frequently makes the two halves strictly comparable. There is no reason, however, why the test may not be divided in some other manner, provided the two halves are comparable as to difficulty.

Student scores on the two portions of the examination are then correlated in the manner shown in Example 11, and the reliability coefficient of the examination is calculated in the manner shown there. The procedure does not differ significantly from that described in the preceding chapter, except that the usual coefficient of correlation, $r = 0.733$, is a meas-

ure of the reliability of only half the test, so that a corrected reliability coefficient for the whole must be calculated by means of the formula included in the example. This corrected coefficient is found to be 0.855. Generally, a coefficient of at least 0.80 is regarded as desirable.

EXAMPLE 11

RELIABILITY OF A TEST

Data: X, scores of students upon odd-numbered questions in the test; Y, scores on even-numbered questions of same test.

Student	Total Score on Odds X	Total Score on Evens Y	X ²	Y ²	XY
A	2	3	4	9	6
B	3	2	9	4	6
C	3	2	9	4	6
D	4	5	16	25	20
E	4	3	16	9	12
F	5	7	25	49	35
G	5	6	25	36	30
H	7	8	49	64	56
I	8	9	64	81	72
J	9	5	81	25	45
Totals	50	50	298	306	288

$$\Sigma x^2 = \frac{n\Sigma X^2 - \Sigma X^2}{n} = \frac{10 \times 298 - 2500}{10} = \frac{480}{10} = 48$$

$$\Sigma y^2 = \frac{n\Sigma Y^2 - \Sigma Y^2}{n} = \frac{10 \times 306 - 2500}{10} = \frac{560}{10} = 56$$

$$\Sigma xy = \frac{n\Sigma XY - \Sigma X \Sigma Y}{n} = \frac{10 \times 288 - 50 \times 50}{10} = \frac{380}{10} = 38$$

$$\sigma_x = \sqrt{\frac{\Sigma x^2}{n}} = \sqrt{\frac{48}{10}} = \sqrt{4.8}$$

$$\sigma_y = \sqrt{\frac{\Sigma y^2}{n}} = \sqrt{\frac{56}{10}} = \sqrt{5.6}$$

$$r = \frac{\Sigma xy}{n\sigma_x\sigma_y} = \frac{38}{10\sqrt{4.8}\sqrt{5.6}} = \frac{38}{10\sqrt{4.8 \times 5.6}} = \frac{38}{10\sqrt{26.88}} = \frac{38}{51.84} = 0.733$$

Reliability of whole test (reliability coefficient):

$$r_1 = \frac{2r}{1+r} = \frac{1.466}{1.733} = 0.855$$

When examinations are found to be deficient in reliability, attention may well be directed to the nature and wording of the questions, as suggested in subsequent paragraphs, and steps should at once be taken to increase the reliability up to a minimum level of 0.80, with a coefficient of 0.90 being distinctly preferable. One way of achieving this objective is to lengthen the examination. If it can be assumed that additional questions are equal in selective value to those already included, then a measure of the length necessary for a satisfactory examination is available and may be secured by use of what is known as the Spearman-Brown *prophecy formula*. The formula appears as follows:

$$r_s = \frac{Nr_t}{1 + (N - 1)r_t}$$

in which r_s is the desired measure of reliability, N is the factor by which the present length of the test must be multiplied, and r_t is the reliability coefficient of the present examination. The usage of this device is illustrated in Example 12, in which a test having a reliability coefficient of 0.70 is

EXAMPLE 12

INCREASING THE RELIABILITY OF A TEST

Data: r_s , the desired coefficient of reliability, in this case 80; N , the factor by which the length of the test must be multiplied; r_t , is the present reliability of the test, in this case 70.

$$\begin{aligned} r_s &= \frac{Nr_t}{1 + (N - 1)r_t} \\ .80 &= \frac{N \times .70}{1 + (N - 1).70} = \frac{.70N}{1 + .70N - .70} \\ .80(1 + .70N - .70) &= .70N \\ .80 + .56N - .56 &= .70N \\ .24 &= .14N \\ N &= 1.715 \end{aligned}$$

This means that the test must be extended to 1.7 times its present length to secure the desired reliability.

found to require extension to approximately 1.7 times its present length in order to attain the minimum reliability of 0.80.

A second and probably more fundamental test of any examination evaluates its validity, that is, the extent to which it actually measures the particular feature or characteristic it is intended to measure. Obviously, such evaluation requires comparison with something in the nature of a criterion, that is, a condition definitely representing the characteristic to be measured. Thus, if the training is assumed to teach salesmanship, then sales might provide a genuine and appropriate criterion. In other cases, known measurements of the characteristic under consideration may be used as a criterion. Thus employee ratings might be so used if the course seeks to instill and develop the characteristics evaluated in such ratings and if the ratings accurately measure these characteristics. No minimum levels for the similarity of examination grades and marks of proficiency registered by the criterion can be given, but such comparisons are generally measured by the usual techniques of correlation, and coefficients must be high if the examinations are to be regarded as thoroughly valid. Where some other test is used as a criterion, it is well to remember that the highest possible measure of validity is equal to the geometric mean of the two reliability coefficients attaching to the two tests.

Item analysis. The most essential test to be applied is what is generally described as item analysis, by which each question in the examination is evaluated to discover how effectively it distinguishes good performance on the test from inferior performance. This result may be secured in a variety of ways. One of the simplest of these divides the papers, on each question, into two groups, one group made up of those who answered the question correctly and the other group of those whose answers to this question were wrong. Then the average of total grades for each group is noted. If the question is effective, the average of those who answered

the question correctly should be appreciably higher than that of those who failed on it. If the opposite result is noted, or if the differentiation is not clear cut, then the question cannot be regarded as satisfactory.

A somewhat more convenient method of item analysis begins by dividing all papers into three groups, classified according to scores. Generally, the groups represent the top quartile, the two central quartiles, and the lowest quartile, respectively. Each item is then checked right, wrong, or unanswered, and totals of correct answers for each group are noted. Numbers of correct answers for each question in each group are then noted. Presumably, the higher group should show larger numbers of correct answers than either of the lower groups, and totals correct for the middle division should be higher than those for the lower division. Where this relationship does not prevail for any given question, it must be regarded as unsatisfactory. Sometimes papers are divided into thirds instead of quartiles, and other such minor variations will suggest themselves in particular situations.

All questions upon which relatively equal results appear for the different groups may be set aside either to be eliminated or to be reframed in a manner to overcome their weaknesses. The same procedure may be followed in the case of reversals, that is, instances in which lower divisions of the papers show a tendency to superior performance as compared with upper divisions. The questions that effectively distribute the papers should, of course, be retained.

There are numerous refinements in the analysis of tests that are applicable in certain cases. Thus, relationships between two tests or between a test and a criterion, may be curvilinear rather than linear. In such a case, some of the techniques for measurement of curvilinear correlation, mentioned in the final chapters of this book, may be employed. Careful scrutiny of the specific problems that arise may suggest other appropriate adjustments.

Exercises

1. Evaluate the training program of the X company by comparing means of the performance scores of training and control groups.

Performance Records

Employee	Control Group			Employee	Training Group		
	At End of Week:				At End of Week:		
	1	2	3		1	2	3
A	10	15	12	A	12	15	14
B	8	7	8	B	16	16	17
C	16	14	13	C	15	14	18
D	15	16	19	D	12	14	16
E	15	20	25	E	10	10	11
F	9	10	8	F	13	14	12
G	12	7	5	G	10	9	12
H	13	15	14	H	9	9	9
				I	12	14	16
				J	11	15	19

2. (a) Compare the following odd-even scores on the final examination of the I company's sales training program and calculate a coefficient of reliability for the examination.

Individual	Total Score	Total of Odd Scores	Total of Even Scores
A	98	48	50
B	97	40	57
C	97	47	50
D	95	46	49
E	93	45	48
F	94	50	44
G	92	42	50
H	90	45	45
I	85	40	45
J	84	44	40
K	83	40	43
L	81	41	40
M	80	38	42
N	80	39	41
O	74	36	38
P	74	34	40
Q	70	39	31
R	68	34	34
S	65	33	32
T	60	29	31

- (b) How much must the test be lengthened to give reasonable assurance of a reliability coefficient of 90?

3. Measure the validity of the examination given at the close of the S company's salesmanship training course, the results of which are compared below with sales of individuals taking the course.

Education and Training

<i>Individual</i>	<i>Examination Score</i>	<i>Weekly sales (in \$100)</i>
A	95	20
B	93	23
C	92	19
D	90	17
E	87	15
F	85	16
G	83	12
H	80	13
I	75	14
J	70	10
K	60	11

4. (a) Make use of the data of exercise 3 to predict probable sales for an individual who scores 91 on the examination.

(b) What is the standard error of this estimate?

5. (a) Make use of the data of exercise 3 to predict the likely examination score of a salesman whose sales amount to \$1800 per week.

(b) Within what limits could you forecast, with practical certainty, that this score will fall?

6. Management wishes to arrive at some conclusion with respect to the value of continuation classes attended by its employees. It compares the amounts of commission earned by a group of employees (reduced for problem purposes) and the credits secured by the same employees in such classes. Analyze the data summarized here to discover:

(a) The coefficient of correlation (Pearsonian).

(b) Its significance.

(c) The predicting equation.

(d) The standard error of estimate.

Chart the relationship, with the standard error of estimate, and predict commissions for an employee with 17 hours of credit.

<i>Employee</i>	<i>Commissions (Y)</i>	<i>Credits (X)</i>	<i>Employee</i>	<i>Commissions (Y)</i>	<i>Credits (X)</i>
1	\$25.00	3	16	\$36.00	18
2	25.00	12	17	37.50	15
3	25.00	9	18	38.00	18
4	27.50	9	19	40.00	15
5	28.00	15	20	42.50	30
6	28.00	12	21	45.00	27
7	29.50	15	22	24.00	6
8	30.00	12	23	22.50	15
9	30.00	21	24	20.00	12
10	30.00	24	25	17.50	9
11	32.50	15	26	15.00	12
12	32.50	21	27	14.00	3
13	34.00	27	28	12.50	3
14	35.00	15	29	11.00	6
15	35.00	18	30	9.00	9

Collateral Reading

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CHAPTER X

Industrial Unrest

IT may be well to pause in the general description of personnel activities designed to discover, secure, and train a satisfactory group of workers and to give brief attention to conditions influencing their effective performance once they have been employed. Attention, in other words, may well be redirected from the selection, placement, and training problems which have been considered to the difficulties attendant upon the efficient use of the working force after it has been carefully chosen and prepared to perform its function.

Obviously, an important factor in determining how efficiently employees perform their duties is their attitude toward the conditions under which they are employed. If conditions are unsatisfactory, that fact is likely to be reflected in performance on the job. But how shall management determine whether or not working conditions are satisfactory? The consideration of various possible means of answering that question is the major purpose of this chapter.

Unrest defined. Generally, dissatisfaction with working conditions makes itself apparent in some form of industrial unrest, so that unrest has come to be regarded as a sort of social fever especially valuable as a diagnostic clue in recognizing and analyzing the causes of employee dissatisfaction. It has been defined as activity arising out of the basic motivations of life, activity which does not, however, satisfy those motivations. It may begin with an individual, but it tends to spread rapidly by a sort of social contagion as it is communicated to others.

Industrial unrest takes many forms. In what is one of

the simplest (a form frequently described as inarticulate), it simply expresses itself in a desire to move along, to keep going, a vague indisposition to stay in one's present position. A similar form finds expression in soldiering, stalling, wasting time on the job. When the dissatisfaction results in deliberation and recognition of conditions that are regarded by the worker as unsatisfactory, then it may become articulate, in which case it frequently gives rise to speeches, pamphlets, complaints to management, and other similar expressions. As it spreads, its emotional background is conducive to crowd behavior, and unrest frequently takes such forms. In fact, the latter are probably the best recognized of all forms of industrial unrest, for they involve disputes, parades, strikes, and picketing. If unrest continues to exist over a considerable period of time, it is likely to become definitely organized, thus resulting in the emergence of mass movements such as labor organizations and other employees' associations.

All forms of industrial unrest are of real significance to those charged with responsibility for personnel control, for they are closely related to the efficient use of labor power. The simpler forms are not, however, readily amenable to description or measurement. Migrating, stalling and soldiering, malingering on the job, and more or less mute dissatisfaction with conditions of work are necessarily difficult to detect and identify. Extensive studies are necessary to get at the facts of migration,¹ while stalling and restriction of output are best attacked by comparisons of time-to-time variations in individual productivity. In one such comparison, workers may be classified according to average daily or hourly output, after which the nature of the distribution thus provided may be critically evaluated. It may be compared with a normal distribution having the same mean and standard deviation, as shown in Figure 18. The appearance

¹See, however, *The Migration of Workers*, Boston, World Peace Foundation, International Labor Office Studies and Reports, Series O, No. 5, 1936; Webb, John M., "Nomads," *Personnel Journal*, October, 1937, Vol. 16, No. 4, pp. 125-133.

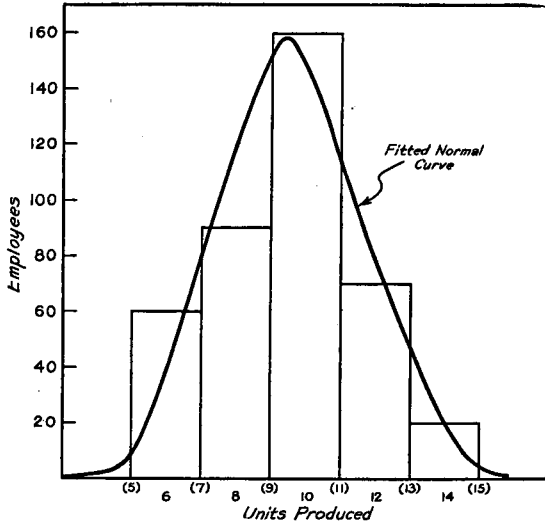


Fig. 18.—Graphic Evaluation of Restriction of Output. (Data: assumed for purposes of illustration.)*

*The data from which Figure 18 has been prepared may be summarized as follows:

Production in Units	Class Marks	Number of Workers
5-7	6	60
7-9	8	90
9-11	10	160
11-13	12	90
13-15	14	20

For a discussion of the procedure involved in the fitting of a normal curve to these data (mean, 9.5; standard deviation, 2.132), see, Davies, G. R., and Yoder, Dale, *Business Statistics*, pp. 107-109, New York, John Wiley & Sons, Inc., 1937. The use of specially prepared graph paper having a probability scale on the vertical axis will be found convenient in this connection.

Where several periods or shops are being compared, the coefficient of standard deviation, sometimes described as the *coefficient of variation*, may prove a useful indication of restriction. It is calculated as the ratio of the standard deviation to the mean. Generally, restriction is greatest where this coefficient is comparatively small.

of definite negative skewness in the given distribution may be regarded as a suggestion of restriction. If several such distributions, representing production at different time periods, are compared, unusual negative skewness in one or more of them would have a similar implication.

A simpler method of evaluating such distributions, a method that avoids the rather extended process of fitting normal curves, merely secures a measurement of skewness for each such distribution. The usual measure is defined by formula as,

$$Sk = \frac{Q_3 + Q_1 - 2Q_2}{Q_3 - Q_1}$$

where the Q 's refer to the values of the various quartiles. If the measure is a fairly large decimal fraction, generally greater than 0.10, and is negative, that fact in itself suggests the possibility of restriction. For the data of Figure 18, for instance, the measure is $Sk = -0.125$.⁸

All forms of inarticulate unrest indicate clearly that employees are not entirely satisfied and that they cannot, therefore, be working most efficiently. Moreover, if such unrest is allowed to continue and to develop, the inarticulate form may be expected to give rise to more serious interruptions in the coöperation of management and labor power.

Industrial disputes. The most obvious and spectacular form of industrial unrest is that which takes the form of strikes and lockouts. It is of that form that most managements think when industrial unrest is mentioned. Of course, the fact that such industrial disputes do represent a most important form of industrial unrest cannot be denied. One reason for the emphasis placed upon them in most discussions of industrial unrest is the fact that they represent one of the few forms of unrest that is amenable to measure-

⁸ See, Vernon, H. M., *Industrial Fatigue and Efficiency*, New York, E. P. Dutton & Co., Inc., 1921; Mathewson, S. B., *Restriction of Output Among Unorganized Workers*, New York, Viking Press, Inc., 1931; Roethlisberger, F. J., and Dickinson, W. J., *Management and the Worker*, Cambridge, Bureau of Business Research, Harvard Graduate School of Business, 1934.

ment. Thus, while soldiering and stalling may be present and apparent, they cannot readily be measured for comparison with other firms or localities or with other periods of time. These comparisons may, however, be made with respect to strikes.

Moreover, there is an extensive range of data with respect to labor disputes that is currently available from governmental agencies, so that comparisons of an individual plant with others in the industry or with disputes in industry as a whole may be readily effected. For many years, the Federal Bureau of Labor Statistics has collected current information with respect to labor disputes. The first count of strikes was made as a part of the federal census of 1880. From 1880 to 1905, by means of four periodic surveys, the Bureau compiled records as to the number of strikes and the industries affected. This accounting was discontinued in 1906 and not undertaken again until 1914. There are no data for intervening years, and that for 1914 is of doubtful reliability. From 1914 to 1926, fairly comprehensive data was secured as to number of strikes, but no accurate accounting was made of causes, results, number of workers involved, and other similar characteristics. Beginning in 1927, however, such additional information was carefully recorded, and, in 1934, steps were taken to revise the statistical procedures. Sources of information were expanded. The occupational classification was reorganized to correspond to that used in the census. Data for the years since 1927 are now available in the revised form.⁴ The Bureau now secures information with respect to thirteen features of current disputes, including: industry, geographical location, number of establishments, number of workers, sex of workers, beginning date, ending date, duration, man-days idle, labor organization involved, causes, results, and method of settlement. From these data, it is possible for the Bureau to pub-

⁴ See, Peterson, Florence, "Methods Used in Strike Statistics," *Journal of the American Statistical Association*, March, 1937, Vol. 32, No. 197, pp. 90-93; also revised summary in *Survey of Current Business*, July, 1937, Vol. 17, No. 7, p. 19.

lish monthly series including number of strikes beginning, ending, and in progress in each month, workers involved in these disputes, and man-days lost.

The Bureau of Labor Statistics bases its reports upon a number of sources. All mediators and conciliators having any federal responsibilities are required to report immediately upon disputes known to them. Meanwhile, the Bureau's clipping service examines some 670 daily papers, labor papers, and trade journals for notes referring to strikes; and it follows up all such clues with correspondence, which explains why preliminary figures are always tentative and final figures are always several months late.

TABLE II
WORKERS INVOLVED IN STRIKES, 1919-1936^a

Year	Disputes in Which Number of Employees Is Reported	Number of Employees	
		Total	Average per Dispute
1919	2,665	4,160,348	1,561
1920	2,226	1,463,054	657
1921	1,785	1,099,247	616
1922	899	1,612,562	1,794
1923	1,199	756,584	631
1924	898	654,641	729
1925	1,012	428,416	423
1926	783	329,592	421
1927	707	329,939	465
1928	604	314,210	520
1929	921	288,572	314
1930	637	182,975	287
1931	810	341,817	422
1932	841	324,210	385
1933	1,695	1,168,272	687
1934	1,856	1,466,695	790
1935	2,014	1,117,213	553
1936	2,172	788,648	363

Recent changes. Many of the most obvious and important characteristics of labor disputes have undergone notable changes with the passing years. The average size of strikes has greatly changed, as has the duration, the relative

^aData since 1927 are revised. See, *Survey Current Business*, July, 1937, Vol. 17, No. 7, p. 19.

importance of various causes, the labor organizations involved, and the aggregate number of disputes. The average number of workers involved in strikes since 1919 reached its peak in 1922, when it was 1,794. The facts for this and other years are summarized in Table II.

Meanwhile, the average duration of strikes was lessening. In 1920, the average was thirty-nine days. No other year has reached this level, and the tendency is definitely toward shorter disputes, a result that may be attributed, at least in part, to the increased mediation facilities. Recent years have been featured by averages of fourteen to sixteen days.

In earlier years, the most important cause of strikes was wages, and a similarly prominent cause was working hours. Recently, especially since the advent of the recovery program in 1933, union recognition has been the major cause.

TABLE III
RELATIVE NUMBER OF STRIKES AND OF EMPLOYEES INVOLVED, 1919 to 1936
1916 = 100

Year	Relative Number of	
	Disputes	Employees
1916	100	100
1917	117	77
1918	88	78
1919	96	260
1920	90	91
1921	63	69
1922	29	101
1923	41	47
1924	33	41
1925	34	27
1926	27	21
1927	19	21
1928	16	20
1929	24	18
1930	17	11
1931	21	21
1932	22	20
1933	45	73
1934	49	92
1935	53	73
1936	57	49

Unions affiliated with the American Federation of Labor were, as would be expected, involved in the larger proportion of all strikes in the past. Recently, however, the strenuous organizational program of organizations affiliated with the rival Committee for Industrial Organization has brought them into the position of greatest prominence.

The relative number of strikes in the aggregate has declined since the war and postwar period. The level of strikes attained in 1917 has not been equaled in any subsequent year, as is shown in Table III.

The data as released by the Bureau and published monthly in the *Monthly Labor Review* are uncorrected for any type of seasonal, cyclical, trend, or residual influences. If they are to be satisfactorily interpreted, it is generally necessary, for this reason, to obtain some perspective with regard to them. Careful analysis of the data over a period of years discloses no definable trend. Data indicate that in both the number of strikes and of workers involved, the immediate postwar years saw heights reached that have never since been equaled, as is indicated in Tables II and III. Furthermore, there appears to be a fairly clear-cut seasonal pattern in the data, with winter months being featured by reduced numbers of disputes and spring and fall representing high spots. Analysis of some fifteen years of data makes possible the following description of monthly seasonal indexes for strikes beginning in each month:

January	89.4
February	81.8
March	96.7
April	143.8
May	158.3
June	108.0
July	106.0
August	106.0
September	107.7
October	86.4
November	68.7
December	46.2

Canadian strikes seem to have followed fairly closely the course of such events in the United States. The postwar

period represents the peak.⁶ There were 298 such disputes in 1919, the largest yearly number, and 43 in 1915, the lowest year. For the period from 1901 to 1929, the total number of strikes was 3,255, or an average of 109 per year. In general, the same kind of data is available as in the United States, except that the most widely used series describes strikes in process rather than those beginning in the month. Major industries, as far as such disputes are concerned, are building, metals, and clothing, in the order mentioned.

TABLE IV
INDUSTRIAL DISPUTES ADJUSTED FOR SEASONALITY, 1936

Month	Actual Number	Corrected for Seasonality
January.....	167	187
February.....	148	181
March.....	185	191
April.....	183	127
May.....	206	130
June.....	188	174
July.....	173	163
August.....	228	209
September.....	234	217
October.....	192	222
November.....	136	204
December.....	132	286

The tabulation showing disputes beginning in each month is the only one, as far as data for this country is concerned, that extends over a sufficient period of years so that seasonal and trend influences may be evaluated. By means of the seasonal indexes given, however, it is possible to make seasonal adjustments in the crude data available from the Bureau. The data of disputes in 1936, for instance, if corrected for seasonality (that is, if divided by the seasonal indexes noted on page 209), appear as shown in Table IV.

Labor turnover. Data with respect to industrial dis-

⁶ See, "Strikes and Lockouts in Canada, 1935," *Monthly Labor Review*, June, 1936, Vol. 42, No. 6, p. 1530; Michael, H., "An Analysis of Industrial Disputes in Canada," *Industrial Canada*, November, 1929, Vol. 30, No. 7, pp. 46-48.

putes are chiefly useful in gauging the general condition with respect to industrial unrest throughout industry, or in comparing one industry with another or with industry generally. For internal analysis, reference is most frequently made to some measurement of labor turnover, that is, the stability of the working force or the shifting of employees into and out of employment.

There are several reasons for the emphasis upon labor turnover as a measure of internal unrest. For one, it is one of the few readily measurable aspects of industrial unrest. As will be explained in succeeding paragraphs, there are accepted standardized methods of computing net labor turnover, so that comparisons with preceding periods or with other concerns are facilitated. Again, turnover is of considerable immediate significance in itself. While some turnover is inevitable—and a small turnover is desirable to bring in new blood and new ideas—high turnover is, in itself, a source of serious problems. It requires more extensive selection and training programs, and these, especially the latter, may be quite expensive. It frequently costs from fifty to five thousand dollars to train a new employee and to prepare him to perform efficiently his function in the work of the organization. Interruptions in production are always expensive. Newcomers are apt to be inefficient and costly in that they may damage raw materials and equipment. They increase wastage costs. Increased turnover requires more extensive employment facilities. Meanwhile, if former employees have quit because of dissatisfaction with the job or the organization, they are a permanent source of ill will that frequently counterbalances expensive advertising campaigns and prejudices potential employees against the management.

Measuring labor turnover. There is no single best way to measure labor turnover. Such measurements frequently contrast turnover, regarded as separations, unavoidable separations, or replacements, with the "stable force," or they refer to "labor mobility" or to "labor flux," and other less fre-

quently mentioned indexes of labor shifts. The more commonly used of these measurements deserve consideration.⁷

The simplest measurement of labor turnover is the separation rate, generally defined as the number of separations per month per one hundred of the working force. Separations include all quits, layoffs, and discharges, and the working force is most commonly regarded as the average number on the payroll during the period for which such a computation is made. The working force is generally measured by adding numbers on the payroll at the beginning of the period and the end of the period and dividing by two. Thus, if the firm began the month with 1000 employees and ended with 2000, the average or working force would be 1500. And if, during the period, 100 employees had severed their relationship with the firm, then the separation rate would be found as,

$$SR = \frac{100}{15} = 6.67$$

The separation rate was regarded as the labor turnover rate in the published calculations of the Bureau of Labor Statistics prior to 1929.

This simple measure of labor turnover is subject to serious criticism. Obviously, it takes no account of either seasonal or cyclical fluctuations, and the latter may be highly important as far as separations are concerned. If business is declining, either because of cyclical change or because of seasonal variation, many separations will be occasioned, not by dissatisfaction or unrest, but by enforced reduction of the working force. Yet all such separations will be included with those others that are due to dissatisfaction with the job. For this reason, the separation rate is not generally used today as a measure of unrest.

The stable force. Even less used, at the present time, is the so-called stable force. The term was originally used by the United States Coal Commission, which defined the

⁷ See, Hackett, J. D., "The Calculation of Labor Turnover," American Management Association, *Committee Reports*, Series 4.

stable force as that per cent of the total annual payroll which was unseparated from that payroll by absence at two or more pay periods. It will be seen that this measure emphasizes employment stability rather than any conception of industrial unrest, and it reflects both personal inclinations and such interruptions of stable employment as result in layoff as well as permanent separation.

Labor flux. A somewhat similar but more meaningful measurement is provided by the conception of labor flux. Its measurement seeks to compensate for seasonality in the industry by taking accessions as well as separations into account. The rate of labor flux is defined as the ratio of the total of accessions and separations to the full-time working force. The full-time working force is variously defined, depending upon usual annual employment in the industry; but the most common interpretation includes only such employees as have averaged 50 weeks of 40 hours each. Thus, in a plant having a full-time working force of 1000 men, if there were 100 accessions and 150 separations in the course of the year, the rate of labor flux would be found as,

$$LF = \frac{A + S}{WF} = \frac{100 + 150}{1000} = \frac{250}{1000} = .25$$

This conception is a convenient and usable one, for it notes both accessions and separations at the same time that the denominator of the ratio is so defined as to exclude any extensive seasonal fluctuations.

The continuance rate. An equally useful measurement is available in the continuance rate,⁹ which is defined as the proportion of employees hired at a specified date who remain on the payroll at the expiration of a given and fairly extensive period of time. Thus, it may be desired to calculate the continuance rate at the end of a five-year period. If there were 1000 employees hired in the first month of the period and 900 of them remain at the close of the period, the

⁹See, Baridon, Felix E., and Loomis, Earl H., *Personnel Problems*, p. 135. New York: McGraw-Hill Book Company, Inc., 1931.

continuance rate is 90 per cent for the five years. By calculating such rates for a series of equal periods, it is possible to set up a basis for prediction of expected normal continuance and thus to assist in forecasting labor needs in advance. At the same time, any notable increase in such rates will appear clearly and may be regarded as a fairly reliable evidence of dissatisfaction with existing working conditions.⁹

The net labor turnover rate. Probably the most widely used measurement of labor turnover at the present time is what is known as the net labor turnover rate, although there is an unmistakable tendency toward the emphasis of its constituent parts rather than of the composite rate. The net turnover rate is defined as the number of replacements per hundred workers in the average working force. Replacements, as the term suggests, are workers employed to fill positions left vacant as a result of separations. In certain accounting periods, accessions will be more numerous than separations. In such periods, obviously, replacements will equal the number of separations. In other phases of cyclical or seasonal change, separations will exceed the number of accessions, and, in such periods, replacements will necessarily equal accessions in number. In all cases, replacements equal the smaller of the two, accessions or separations.

Most business firms that make use of the net labor turnover rate or its constituent rates follow in detail the procedure outlined by the Bureau of Labor Statistics for turnover accounting. The Bureau, which took over the collection and publication of turnover rates for the nation as a whole from the Metropolitan Life Insurance Company in 1929, secures the following data from reporting firms each month:

1. The number on the payroll at the beginning of the period.
2. The number on the payroll at the end of the period.
3. The number of quits.

⁹ See, Sullivan, Mary L., *Employment Conditions in Department Stores in 1932-35*, Washington, Bulletin of the Women's Bureau, No. 125, 1936.

4. The number of discharges.
5. The number of layoffs.
6. The number of total separations (usually the total of numbers 3, 4, and 5).
7. The number of accessions.

The form used by the Bureau for this purpose is illustrated in Figure 19.

The terms involved in this reporting are defined by the Bureau as follows:

An accession is the hiring of a new employee or the rehiring of an old employee.

A separation is a termination of employment of any of the three following kinds: quits, layoffs, and discharges.

A quit is a termination of employment, generally initiated by the worker because of his desire to leave, but sometimes due to his physical incapacity.

A discharge is a termination of employment at the will of the employer, with prejudice to the worker because of some fault on the part of the worker.

A layoff is a termination of employment at the will of the employer, without prejudice to the worker. A permanent layoff, a long layoff, an indefinite layoff, and a short, definite layoff with the name of the worker removed from the payroll are counted by the Bureau as layoffs, but a short, definite layoff with the name of the worker remaining on the payroll is not counted as a separation. . . .

Transfers from one plant to another of the same company are not considered accessions or separations.

The Bureau at present compiles monthly reports on the basis of returns from more than five thousand manufacturing establishments employing approximately 2,500,000 workers. Monthly composite rates representing the experience of some 2,500 employers in 144 lines of manufacturing are published regularly in the *Monthly Labor Review*, and individual industry rates for 16 separate manufacturing industries representing some 4,200 establishments are also available.¹⁰

Data are published in the form of quit, discharge, layoff,

¹⁰ *Monthly Labor Review*, December, 1935, Vol. 41, No. 6, pp. 1584-1587; Byer, Herman B., and Anker, John, "A Review of Factory Labor Turnover, 1930 to 1936," *ibid.*, July, 1937, Vol. 45, No. 1, pp. 154-175.

total separation, and accession rates. In each case, the reports of individual concerns are weighted as to size. The rates are calculated, for example, as the number of quits per hundred employees, or as the number of quits divided by the average working force and multiplied by one hundred. The

U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS
U. S. G. P. 1933

CURRENT REPORT ON TURNOVER OF FACTORY LABOR

PERIOD COVERED BY THIS REPORT IS _____ to _____ (Inclusive)
(Please report for calendar month or base weeks of 52 weeks)

I. SEPARATIONS DURING PERIOD:

(a) Number of quits (and miscellaneous separations, died, superannuated, and permanently disabled) _____

(b) Number of discharges _____

(c) Number of lay-offs _____

(d) Total number of separations _____
(If item (d) does not equal the sum of items (a), (b), and (c) please explain discrepancy.)

II. NUMBER OF ACCESSIONS DURING PERIOD
(including both first employments and rehires) _____

III. NUMBER OF FACTORY WORKERS ON PAY ROLL

Number on pay roll at { end of preceding period _____
end of current period _____

Comments on any special incident affecting your figures this month:

If any change has been made in the person to whom future reports on Labor Turnover should be addressed, please note here:
_____ (Name of Company)

NOTE.—Office employees and salesmen are NOT included in this report.
After filing in, please mail before the fifth of the month, if possible, to

COMMISSIONER OF LABOR STATISTICS
WASHINGTON, D. C.

Fig. 19.—Current Report on Turnover of Factory Labor.

average working force is calculated as the average of the number on the payroll at the beginning and at the end of the month. Thus, for a firm reporting 45 quits, 20 discharges, 35 layoffs, 100 total separations, and 50 accessions, with a payroll declining from 1025 at the beginning of the month to 975 at the close, the rates would appear as follows:

Quit rate, $45/10$, or 4.5.

Discharge rate, $20/10$, or 2.

Layoff rate, $35/10$, or 3.5.

Total separation rate, $100/10$, or 10.

Accession rate, $50/10$, or 5.

Actual annual rates are calculated as the total of monthly rates.

The Bureau prepares the composite rates, as has been indicated, by weighting the rates of individual firms according to the number of employees and calculating a weighted arithmetic mean to represent the group as a whole.

The net labor turnover rate, when such individual rates are calculated, is readily available as the separation rate or the accession rate, whichever is smaller. In periods of business recession, the net turnover rate is generally equal to the accession rate; in periods of expansion, the net turnover rate tends to equal the total separation rate.

Data and rates are not corrected for the number of days in the month, and such corrections may result in significant variations from crude figures. One of the most common methods of effecting this adjustment of data available for a period of only one or more months (and a method which also facilitates comparison with annual data) calculates what are known as *equivalent annual rates*. These rates are merely monthly rates multiplied by a factor representing 365 divided by the number of days in the given month. Thus, for a month of 30 days, the factor is 12.17; for a month of 31 days, 11.77; for 28 days, 13.04; for 29 days, 12.62.

In order to illustrate the calculation of the equivalent annual rate, reference may be made to the data mentioned in an earlier paragraph in explanation of the simple rates.

The net turnover rate, in that instance, is 5. If the month were June, the equivalent annual rate would be 12.17 times 5, or 60.85. If the month were December, the equivalent annual rate would be 58.85. The device eliminates the difference in the length of various months, thus facilitating comparison between them, at the same time that it makes possible the comparison of monthly and annual data.

While the net turnover rate is subject to serious limitations, it has distinct advantages over earlier widely used measures. One of its weaknesses is the fact that it does not take account of seasonality. It is, in other words, a crude, unadjusted figure. Another and more serious objection, from the standpoint of personnel administration, is the fact that it does not distinguish types or causes of turnover, so that replacements of all types, whatever their reason or significance, are lumped together. Furthermore, the nature of the published data makes analysis to distinguish causes or types of turnover impossible.

On the other hand, the net labor turnover rate and its constituent rates represent a much more satisfactory type of accounting than some of the earlier procedures. The net rate takes account of cyclical and seasonal swings, and its dependence upon replacements as the measure of turnover avoids the obvious difficulties of the former practice which regarded the separation rate as the turnover rate, without reference to accessions. Moreover, the uniform system of accounting and reporting makes possible inter-industry comparisons as well as the comparison of individual firms with parent industries as a whole. Thus the annual net turnover rate for automobiles in 1936, 77.86, may be readily compared with the similar rate for iron and steel, 22.10. Again, the monthly net turnover rate for slaughtering and meat packing in April, 1937, 6.58, may be arrayed against that of boots and shoes for the same month, 1.11. Obviously, individual firm rates in these and fourteen other industries may be just as readily compared with rates for the industries as a whole.

Refined rates. In measuring turnover within an individual concern, it is generally desirable to take account of

conditions peculiar to the industry by effecting various refinements in the cruder measurements of separations, accessions, and replacements. Thus, it may be desired to eliminate from further consideration what may be regarded as unavoidable separations. For instance, death may be so regarded, and, if women are required to terminate employment when they marry, then marriage may be similarly considered. Generally, if such refinements are undertaken, the refined rate is regarded as the ratio of avoidable separations to average working force (per hundred), and the rate is expressed as

$$T = \frac{S - U}{F},$$

where U refers to unavoidable separations. Many conditions other than those of death or marriage may be regarded as causes of unavoidable separation in particular industries.

Turnover analysis. The measurement of labor turnover is but the first step, as far as personnel interest in labor unrest is concerned. More important is the careful, critical analysis of turnover and of other indications of unrest as well, to discover where and why they appear. Information on these questions is sought from a variety of sources. Individuals may be interviewed to discover their attitudes and opinions. If these individuals appear to be important sources of unrest, their confidence may be cultivated to discover whether their discontent is the result of real or imagined maladjustments. In some cases, such individuals may profitably be subjected to psychiatric examination.

Many conditions affecting all workers rather than individuals may be highly relevant to changing levels of current unrest. Thus changes in wage rates, working hours, or related conditions; variations in managerial policies, including the introduction of representation plans and various services for employees such as pension plans, lunchrooms, and others; unionization; and countless features of changing industrial relations may have far-reaching effects on industrial unrest. It is frequently convenient, in attempting to get a perspec-

tive with which to view the relationship of such changes to unrest, to chart current measures of unrest as a time series, and then to note on the chart all definitive dates marking changes in policies.

Further analysis seeks to discover what types of employees are most subject to dissatisfaction. Thus, sources may be profitably compared, especially if such sources have been carefully defined. If, for instance, extremely high levels of performance in high school or college have been required of some new admissions, it may be found that persons so selected are unfitted for the simpler types of work to be done, or a similar limitation may characterize workers from certain other sources. Employees may be divided into a variety of classes and groups to discover which of such classes show higher and lower measures of unrest. Thus distinction may be made between sexes, races, nationalities, married and unmarried people, and older and younger workers.

The techniques of correlation analysis may be employed to discover and measure possible co-variation between indexes of unrest and such varying characteristics of employees as length of service, test scores (including mental alertness, trade tests, and others), age, productivity or proficiency, education, and similarly quantitatively measurable features. If relationships between unrest and some of these characteristics are found to be significant, that is, if increases in the one are accompanied by fairly regular increases or decreases in the other, recognition of this condition may prove valuable as a basis for selection, prediction of success, or further intensive investigation directed at understanding the reasons that underlie it.

All such analysis aims at one basic objective—the discovery of roots or causes of industrial unrest. Every managerial policy and every phase of physical working conditions must be regarded as a possible source of discontent and evaluated from that point of view. Promotional systems, methods of wage payment, hours of employment, health conditions—all these and many more may give rise to dissatisfaction. Some key to current attitudes may be gained

from constant attention to suggestion systems and complaints, and acquaintance with employees may encourage an exchange of confidences that will help those in charge of personnel to gauge the changing moods of workers. The problem is one that relates to every phase of industrial relations and that is constantly changing. Only constant alertness and investigation can keep abreast of its developments.

Exercises and Problems

1. Utilizing the seasonal indexes presented on page 209, provide seasonally corrected data with respect to the numbers of industrial disputes each month in the most recent year for which complete data are available. (Data from the *Monthly Labor Review*.)

2. Summarize, in outline form, the steps you would take to evaluate industrial unrest if you were charged with responsibility for the industrial relations of a large concern.

3. Given the following data from the payrolls of the B company:

Number on the payroll, January 1, 1937.....	975
Number on the payroll, January 31, 1937.....	1025
Changes, January, 1937:	
Quits.....	5
Layoffs.....	90
Discharges.....	5
Accessions.....	150

To find:

- (a) Separation rate for January, 1937.
- (b) Net turnover rate for January, 1937.
- (c) Equivalent annual rates.

4. Management seeks to evaluate the possible relationship between earnings and absenteeism, for which purpose it analyzes the following data (reduced for problem purposes):

Employee	Daily	Monthly
	Earnings	Absences
	X	Y
A	6	2.3
B	8	2.2
C	5	2.1
D	7	2.6
E	4	2.0
F	9	2.5
G	3	1.5
H	10	3.0
I	2	1.8
J	11	2.0

- (a) Find the ranking coefficient of correlation.
- (b) Calculate the Pearsonian coefficient of correlation.
- (c) Evaluate the significance of the latter.
- (d) Discover the equation for the linear regression of absences on earnings.

(e) Note the standard error of estimate, and chart the relationship.

(f) Estimate absences for a workman having daily earnings of \$3.50.

5. Management is comparing production in one shop at two different periods to discover indications of restriction of output. Available data may be tabulated as follows:

Production in Units per Day	Number of Employees	
	First Period	Second Period
8-10	20	50
10-12	60	90
12-14	120	150
14-16	200	190
16-18	110	50
18-20	70	20

(a) Chart the data as a rectangular chart or histogram for each period.

(b) Calculate the measure of skewness in each case and indicate the significance of your findings.

(c) Fit a normal curve for comparison with each histogram, and note your conclusion as to the comparative evidence as to restriction of output.

(d) Measure the coefficient of standard deviation or variation in each case. What does their comparison appear to indicate with respect to restriction of output?

Collateral Reading

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CHAPTER XI

Hours of Work

CONSIDERATION of significant aspects of working conditions might well begin at any one of many angles. Employment, rating systems, wages, systems of promotion and transfers, health considerations, policies with respect to collective bargaining, service features, and a number of other similar phases might be selected as starting points without serious objection. Here, a beginning is made by reference to the subject of working hours.

The subject so described is somewhat more inclusive than might at first appear. It is concerned, obviously, with the number of hours per day and per week, but it also requires consideration of holidays and vacations, the use of overtime, the possible spreading of work so that shorter hours may provide a basis for more extensive employment, the special problems of night employment, and the highly important consideration of intermissions and rest periods. In considering all these aspects of the hours of employment, the major objective is their evaluation in terms of their effect upon the efficiency of the labor force. At the same time, in formulating policies with respect to hours of employment, attention must also be given to other considerations, including especially federal and state legislation, social considerations, and economic implications of varying work periods.

Tendency toward shorter hours. Management has become rather generally aware, in recent years, of the fact that there is a long-time tendency in this country toward shorter hours of work. Table V presents a brief summary of such changes for industry as a whole in the years since 1840. While information is in some cases fragmentary, the long-

Hours of Work

run tendency is unmistakable. In many types of business, the changes are especially striking. Thus, one hundred years ago, in 1840, railroad workers on the transportation lines of the time were employed for an average of 70 hours

TABLE V
ESTIMATED WORKING HOURS
1840-1935

Year	Average Weekly Hours of Work
1840	68
1850	69
1860	66
1870	63
1880	61
1890	58
1900	57
1910	54
1920	50
1921	48
1922	49
1923	48
1924	47
1925	47
1926	47
1927	47
1928	46
1929	46
1930	45
1931	41
1932	38
1933	38
1934	35
1935	37

Sources: Yoder, Dale, *Labor Economics and Labor Problems*, p. 277, and *Monthly Labor Review*, April, 1936, Vol. 42, No. 4, pp. 857-858.

per week; and teamsters, textile workers, and machinists averaged approximately 80 hours per week. After many years of slow, gradual reduction, the 8-hour day and a 45-hour week had become fairly typical of a large part of all industry by 1929. In that year, the average work week for organized workers totaled 44.8 hours, while that of unorganized workers appears to have been only slightly longer.¹

¹ Cahill, M. C., *Shorter Hours; a Study of the Movement Since the Civil War*, New York, Columbia University Press, 1932; Tepir, Lassare, *Hours of Labor*, Baltimore, Johns Hopkins University Press, 1932.

With the beginning of the depression in 1929, the movement toward shorter hours was accelerated. The Bureau of Labor Statistics conducted a survey of 44,000 establishments with more than 3,800,000 workers in 1931 and found that 2.4 per cent reported permanent adoption of the 5-day week for all or part of their employees and that 5.6 per cent of all employees were working on a five-day week basis. A similar survey in 1932 found that the 5-day week had been adopted by 5.4 per cent of the firms and affected 8.4 per cent of the employees. In manufacturing industries, these percentages were considerably higher, with 7.8 per cent of the establishments and 12.3 per cent of all employees operating on this basis. The automobile industry reported that 67.2 per cent of its employees were working on the 5-day week. Other industries having large proportions of 5-day week workers included tobacco processing (40 per cent), druggists' preparations (39.9 per cent), and electrical apparatus (38.6 per cent). All these reductions to a 5-day week basis were described by management as permanent arrangements.

Meanwhile, of course, working hours were greatly reduced in many industries as a temporary adjustment to depression conditions. By 1933, average hours for employed workers were approximately 40 per week, and the average of all employees in manufacturing and non-manufacturing industries reported by the Bureau of Labor Statistics was 37.2 hours per week in 1934. For manufacturing industries, the averages were 37.9 hours in 1933 and 35.2 hours in 1934. It is probable, of course, that the influence of restricted production, coupled with that of the newly instituted industrial codes, introduced a more rapid reduction than would otherwise have appeared, and it is equally likely that continued recovery will see some lengthening in these hours as production expands.³

Actual versus nominal hours. Confusion is likely to arise, in discussions of hours of work, because comparisons

³See, *Shorter Work Periods in Industry*, New York, National Industrial Conference Board, 1932.

are made between *actual hours* at one time or in one industry and *nominal hours* in others. Actual hours, as the term is used in reporting upon this feature of employment, are calculated as the total of man-hours divided by the number of employees. They are, therefore, the *average* number of hours of employment for each employee who was employed in the period under consideration. The measurement of nominal hours is somewhat more complicated. It refers to what are regarded as the *nominal* or stated hours of operation of a given plant. Where nominal hours for a group of plants are given, the figure is derived by (1) multiplying the nominal or stated hours of operation in each plant by the number of employees in that plant, and (2) totaling these products and dividing their sum by the total number of employees in all plants.

The distinction between actual and nominal hours is decisive, as may be gathered from the following comparison of nominal and actual weekly hours of employment in the manufacturing firms reporting to the National Industrial Conference Board:

<i>Date</i>	<i>Actual Hours</i>	<i>Nominal Hours</i>
1914	51.5	55
1927	48.4	49.5
1928	48.1	49.7
1929	49.1	49.7

Generally, nominal hours are greater than actual hours, in spite of overtime.

Bases for hour policies: *Current changes.* When hours are being reduced or extended in industry generally, that fact is important from the standpoint of personnel control, for it may readily affect employee attitudes toward existing provisions or contemplated changes. It is worth while, therefore, to know of such changes. Two reporting agencies provide current indexes of hours in industry in the United States. The Bureau of Labor Statistics reports monthly on changes in actual hours in manufacturing and selected non-manufacturing industries, and changes are published in the

Monthly Labor Review. Data are thoroughly representative of manufacturing industries, and those for some thirteen non-manufacturing industries permit monthly comparisons back to January, 1933. The National Industrial Conference Board releases monthly averages of actual weekly hours for factory workers, and these measures are available in the *Survey of Current Business*. Data are collected for the first full week in each month. Reports are received from approximately 2000 factories in 25 different industries employing, in 1935, some 1,532,000 wage earners, or almost 20 per cent of all such workers in this country. Composite figures are made available by weighting each industry's average according to its importance in industry as a whole, as revealed by the Census of Manufactures of 1923 and subsequent studies by the Conference Board. Numerous trade associations provide current information with respect to both nominal and actual hours of employment within particular industries.

Traditional hours. Account must frequently be taken, in evaluating policies with respect to working hours, of what are regarded as traditional work periods in the industry or business. Where the 5-day week has been firmly entrenched, for instance, it may readily be regarded as of special virtue on that account. Certain trades and occupations have become accustomed to particular arrangements, as far as working hours are concerned, and changes may be regarded with suspicion and opposition regardless of their inherent merit.

In some cases, union regulation provides definite limitations upon working hours. Obviously, where such conditions exist, they are an important factor to be taken into account in formulating any policy with respect to hours.*

Transportation facilities. In some cases, hours may have to be adjusted to take account of limitations upon transport-

* See, annual bulletins, "Union Scales of Wages and Hours of Labor," Bureau of Labor Statistics; "Hours of Work and Wages in the United States Under the Codes of Fair Competition," *International Labour Review*, June, 1935, Vol. 31, pp. 859-863.

tation facilities by which employees come to work. Generally, this consideration has become less important as the use of personal automobiles by workers has increased, but many plants find it desirable to stagger opening and closing hours for various groups to avoid traffic congestion, and this is especially true if plants are located at some distance from homes of employees, so that large numbers of them depend upon street-cars and buses for transportation.

Legislation. Federal and state laws, with the passing of years, have become increasingly important factors in determining working hours. Today, every state in this country has laws affecting and regulating the hours of employment of certain types of workers. Most common of such laws are those relating to the employment of minors, but other legislation regulates employment of men and women in many states. Furthermore, it may be expected that there will be additional legislation affecting adults if constitutional barriers to such legislation are removed or can be circumvented.

Restriction of hours of employment for children has been most effectively accomplished by compulsory school attendance laws. These laws vary from state to state, but a majority of states now require attendance through the eighth grade, and many require high school attendance or schooling up to a certain age, commonly sixteen years. Laws further require that such children must secure work certificates from school authorities in order to accept employment, so that an effective regulative device is thus provided. Meanwhile, some twenty-five states have ratified an amendment to the federal Constitution that will permit the federal government to regulate child labor. If the amendment becomes effective, it may be expected that federal legislation will definitely limit hours of employment for minors throughout the nation.

Forty-four states now limit the employment of women. Such legislation has grown continually more extensive since the United States Supreme Court in 1908 upheld an Oregon statute limiting employment to ten hours in mechanical

shops, factories, and laundries. Limitations upon hours generally apply to specified industries and most frequently exclude certain night hours, although a California law restricting employment to eight hours in all industries was upheld by the Court in 1914.

State legislation relating to the hours of employment for men are of several types. One type merely limits hours upon public employment. Such laws have been sustained by the courts and have been effective for both state and federal employees for many years. Another type goes only so far as to describe the policy of the state as to what it shall consider a reasonable day's or week's work, with no penalty for exceeding the limit thus suggested. A third type limits hours for workers in industries where such limitation may be justified by the public interest in safety, as is the case with workers on the railroads, seamen, bus drivers, and truck drivers.

A fourth type of legislation limits hours in what are regarded as highly hazardous or unhealthy occupations, commonly including those of miners, smelter workers, and those engaged in tunneling or working under extremes of air pressure. A fifth type regulates hours in industries where it is generally believed that accidents and ill health are increased by long working hours. A final type of hour-regulation for men requires merely specified minimum rest periods. Such legislation may, for instance, prohibit employment of railroad workers for more than 10 out of 12 hours in any one day, or for more than 16 out of 24 consecutive hours, or it may require a pause for rest and food in each 8 hours of employment.⁴

⁴See "Legal Restrictions on Hours of Labor of Men in the United States as of January, 1936," Washington, Bureau of Labor Statistics, Bulletin No. 385, 1936; *Reduction of Hours of Work*, Vol. VI, "Principal Statutory Provisions Limiting Hours of Work in Industry," 1935, Geneva, International Labor Office. Actual data as to regulations is not outlined here, because extensive changes are constantly in progress. The following excerpt from *The Digest of State and Federal Labor Legislation*, Washington, Division of Labor Standards, Bureau of Labor Statistics, 1937, presents a brief summary:

The legal status of legislation restricting the working hours of men is not entirely clear. As early as 1898, the United States Supreme Court in *Holden v Hardy* (169 U.S. 366) held that the legislature of a state has the right to regulate hours of workers in mines, smelters, and ore refineries. In 1905, however, the same court held a 60-hour limitation upon the work-week of bakers, imposed by the legislature of New York, to be unconstitutional in a five-to-four decision (*Lockner v New York*, 198 U. S. 45, 64, 65, 74). The situation became increasingly complicated when, in 1917, a statute of Oregon limiting hours of all workers, men and

"Prior to 1937 the best hours standard embodied in a State law had been the 8-hour day and 48-hour week for women. This year Pennsylvania took the lead not only in reducing its maximum from 54 to 44 a week, but in making the new standard apply to all workers, men as well as women. North Carolina also legislated for men, establishing a 10-hour day, 55-hour week, while women's hours were reduced from 10 to 9, and from 55 to 48. At present one State (Pennsylvania) has the 8-hour day, 44-hour week; 12 States (Arizona, California, Connecticut, Illinois, Kansas, Nevada, New Mexico, New York, Ohio, Oregon, Utah, Wyoming) and the District of Columbia have an 8-hour day and 48-hour week for women. Three States (Massachusetts, North Carolina, Rhode Island) have a 9-hour day and 48-hour week. One State (New Hampshire) has a 10-hour day and 48-hour week; Colorado and Montana have the 8-hour day. Laws providing for either these daily or weekly limits, or both, were enacted this year by Illinois, Nevada, New Hampshire, North Carolina, Ohio, and Pennsylvania.

"The State hours laws still vary considerably as to coverage, and as to number and extent of exceptions permitted. However, there is a marked tendency to extend the application of the laws; the most noteworthy gains in that direction this year occurred in New York, where the limitations as to daily and weekly hours were extended to women and boys under 18 in hotels and restaurants, and the provision for 1-day's-rest-in-7, to all employees in these establishments. Pennsylvania eliminated its former exception for canneries; Ohio changed from enumerated to general coverage, but retained most of the specified exemptions; Illinois extended its law to include women in beauty parlors and certain officers; Arkansas extended its law (still with a 9-hour day and 54-hour week standard) to cover hotels, restaurants, banks, insurance companies, public utilities, and elevator operators in all establishments. Massachusetts, Pennsylvania, and in particular, Illinois extended the weekly day of rest requirement to include additional groups of employees mostly in service industries, where hours are notoriously long and rest days few. New York has extended the 8-hour day, 48 hour and 6-day week to kitchen and culinary workers in State institutions. Pennsylvania has included employees of the State, political subdivisions, and public institutions in the new 8- and 44-hour law."

women, to ten hours per day, in any mill, factory, or manufacturing establishment was upheld by the Court (*Bunting v Oregon*, 243 U. S., 426, 438). Three of the justices dissented, but the case has been generally accepted as reversing the 1905 decision, and most recent state legislation has proceeded upon the assumption that the state may regulate hours of work of any of its citizens, since their health is a matter of public interest. This current impression is substantiated by the declaration made by the late Chief Justice Taft that he believed the *Lockner* case to have been overruled by the *Bunting* case.⁵

More recently, additional regulation has been imposed upon working hours of men by the federal Walsh-Healy Act of 1935, which requires certification that employees have not worked more than 40 hours per week on goods purchased by contract (in a total amount exceeding ten thousand dollars) by the federal government.

Social considerations. There are definite social considerations, quite apart from limitations imposed by government or by labor organizations, that must always receive careful attention from intelligent management. The health of workers deserves constant attention, and no policy with respect to working hours can be justified if it imposes serious hazards in this direction. The health of children may be affected by the employment of mothers and must also be taken into account as a factor of importance in the hours of women workers. Further, it is highly important, in the long-run, that employees have time to participate on an informed basis in the political activity of the community, if democracy is to prove successful as a system of government. Employees should have sufficient leisure so that they can, if they so desire, develop their homes and enjoy their families. Such developments are known to be closely related to good employee morale. Furthermore, while it is scarcely possible to assume that it is industry's obligation to develop all the varied aspects of its employees' personalities, as some

⁵In *Adkins v Childrens Hospital*, 261 U. S. 525, 564 (1923).

idealistic writers have suggested, yet it is important that workers have time to read, travel about, and engage in those self-educating activities that make for general cultural development, and a far-seeing policy with respect to working hours will take this consideration into account.⁶

Basic economic considerations. Probably the most obvious factor to be taken into account in establishing hours of employment is the nature of the industrial operations involved. Some industrial processes may be readily begun and as readily discontinued, and some may be interrupted at any point without serious difficulty. Others, when once begun, must be continued until they are complete, and their completion may require several days or weeks. Some operations are, in other words, continuous. Thus, in certain types of corn refining, it is necessary to operate on a continuous, twenty-four hour basis from start to finish of the "run," and a similar condition prevails in certain aspects of steel making. In such situations, it is apparent that hours will have to be so arranged as to provide a steady supply of workers.

Equally important is the volume of work to be accomplished, and a third obvious factor influencing the hours of work is the number of employees that can be accommodated efficiently.

Sometimes it is argued that economic considerations dictate a continuous change toward shorter hours, so that workers may have more time to consume the increasing products of modern industry. It is said that holidays should be increased in number and concentrated about weekends, so that workers will be encouraged to travel and spend their wages. The suggestion is an interesting one, but it cannot be given great credence, because it implies that workers do not spend their incomes at present. About all

⁶ See, Person, H. S., "The Work-Week or the Work-Life," *Bulletin of the Taylor Society*, December, 1928, Vol. 13, pp. 230-248; Frankl, P. T., *Machine-Made Leisure*, New York, Harper & Brothers, 1932; Burns, C. De L., *Leisure in the Modern World*, New York, D. Appleton-Century Company, Inc., 1930.

that could be expected from such a change would be a shift in expenditures from some consumption goods to others, and it is significant that one of its leading advocates is an automobile manufacturer.

More commonly proposed as an essential economic consideration is the suggestion that hours be adjusted to provide more extensive employment. As usually stated, the proposal argues that if one fourth of the workers in an industry or locality are unemployed, then what is necessary is that the three fourths who are employed should reduce their work by one third, so that the unemployed may be put to work. The idea has general acceptance among union workers and has been accorded rather common popular approval. Many managers appear unable to see any fallacy in the reasoning, so that they do not criticize it, although they may see some difficulties in the way of putting it into effect.

As a matter of fact, the suggestion has many implications of which its advocates are almost entirely unaware. Its unstated assumption is, rather apparently, that either (1) there will be no increased labor costs arising out of such a change, or (2) such costs can be readily taken out of profits or passed on to consumers.

Most advocates of the plan propose that present workers shall not suffer as a result of the change. To that end, and as the only possible means of shifting the burden of unemployment relief from the shoulders of the present employed group, they propose that the latter shall take no cut in daily or weekly pay. Unless, therefore, production per hour is increased proportionately to the increase in hourly wages, labor costs will rise. Moreover, if efficiency does so increase, and demand for the product remains stationary, then the additional workers will not be needed, after all. In order to use these additional employees, it is assumed, therefore, that productive efficiency does not rise, so that labor costs must do so. The increasing labor costs must come out of profits, or they must be passed on to consumers. In certain industries, enjoying a considerable degree of monopoly, it

may be possible to force profits to absorb the additional costs. That such an absorption is not possible for industry generally, however, is apparent from the fact that profits and losses in the aggregate tend to balance. It is also clear from the fact that, if such profits existed prior to the appearance of the additional costs and amounted to so much that they could stand the new deduction, they would have encouraged additional entrepreneurs to enter the field to the point where production became less profitable.

The conclusion is, therefore, that they must be passed on to consumers in the form of higher prices. But consumers do not buy without reference to price, and price increases or decreases have definite effects upon the quantities of goods that are consumed. Elasticity of demand is not an imaginary concept; it is a description of a realistic condition. For a comparatively few goods and services, elasticity is negligible; regardless of price, approximately the same quantities will be taken. For the vast majority of such values, however, price changes are reflected in demand, and rising prices mean smaller consumption.

As consumption is reduced, that fact is inevitably reflected in employment, so that the attempt to increase employment actually exerts a powerful influence in just the opposite direction. The extent to which this effect operates in each industry depends upon the elasticity of demand for its products and upon the significance of labor costs in the industry. Douglas has concluded, after extensive investigation, that, on the average, a 1 per cent increase in wage rates tends to reduce employment from 3 to 4 per cent.⁷

The fact is that the reduction of working hours can be effective as a means of increasing employment only in a very temporary and transitory situation. In such a situation, it tends to throw the burden of relief on the shoulders of employed workers rather than upon society as a whole. And the long-time effects of extensive hour reductions, where

⁷ Douglas, Paul, *The Theory of Wages*, pp. 151, 152, and 501ff. New York: The Macmillan Company, 1935.

wages are maintained by increasing hourly wage payments, tend to reduce rather than to expand employment.⁸

Shorter hours for higher wages. Laborers, especially those who are or have been members of labor organizations, frequently support the cause of shorter hours on the ground that reduction of hours is a means of increasing employees' real earnings. Shorter hours, they insist, result in higher wages.

This argument is an interesting one. In many cases, it is based on the historic experience of labor, in which it is unquestionably true that numerous hour reductions over the years have been steadily accompanied by increases in real wages. A chart of long-time changes in working hours and in real wages will clearly portray this apparent relationship.

Sometimes there is a further argument advanced in behalf of this contention. It is said that since wage earners have a monopoly of such services, they can limit the available supply and raise the price at will.

The chief defect in this argument lies in its failure to recognize two facts, the first being that there are numerous substitutes for labor, and the second that there is no great possibility of effective organization to control supply except in those trades where skill is high. In the highly skilled trades there is truth in the assertion, and restriction of the supply of hours available unquestionably tends to raise the price per hour. Whether it can raise it in amounts proportionate to the reduction in working time per worker (and

⁸ As illustrations of the arguments on this point, see, Bliss, Charles A., "Production in Depression and Recovery," *Bulletin 68*, National Bureau of Economic Research, November 15, 1935, p. 9ff; Carver, T. N., "The Theory of the Shortened Work Week," *American Economic Review*, September, 1936, Vol. 26, No. 3, pp. 451-462; Lawson, George W., "Unemployment Solutions: Shorter Week and Hours," *Proceedings of National Conference of Social Work*, 1931, pp. 284-288; Macartney, C. A., *Hours of Work and Employment*, London, League of Nations Union, 1934; Moulton, Harold G., *Income and Economic Progress*, p. 66ff, Washington, Brookings Institution, 1935; *Shorter Work Periods in Industry*, New York, National Industrial Conference Board, 1932; Weston, N. A., "Shorter Working Time and Unemployment," *American Economic Review*, March, 1932, Vol. 22, No. 1 (Supplement), pp. 8-15.

thus maintain daily or weekly totals of earnings) is another question, and its answer depends upon conditions in the industry, the cost of substitutes, and the nature of the demand for such services. In the semiskilled and unskilled groups, however, the same effect is difficult if not impossible to achieve, because machinery is always a potential substitute for unskilled labor, and supplies are difficult if not impossible to control.

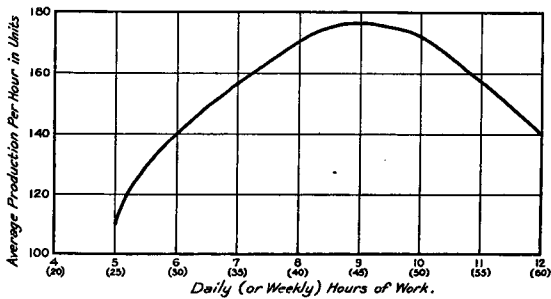


Fig. 20.—Productive Efficiency at Various Hours. (Data: hypothetical.)

Furthermore, there is a highly important question as to how such reduction may affect the actual or average productivity of individual workers. In some instances, reductions tend to make workers much more efficient during the hours they work. In others, no such result obtains. Apparently the situation in any particular industry is somewhat as pictured in Figure 20. At extremely short hours, per day or per week, hourly productivity of workers is low. As hours are increased, productivity increases, up to a point. Thereafter, productivity per hour declines as hours are increased. An essential question, therefore, in evaluating possible changes in working hours, is that of the probable effect of such changes on hourly productivity. The question is, will

reduction in the number of hours worked increase or decrease hourly efficiency?

Few industries are aware of their positions at any given time. It is probable that the curves themselves change with changing attitudes on the part of the workers, and it is almost certain that they vary with changes in industrial technology. It may readily be true that the only method of establishing the nature of this relationship for any particular industry is experimentation, and while relationships within the industry and from one plant to another employing the same processes are probably quite similar, there is every reason to suppose that there would be wide differences among industries and among different types of industrial processes in the same industries.

Moreover, there is good reason to suspect that while the whole curve representative of this relationship is not known for many industries, there has been a distinct tendency to approximate the point at which production is most efficient. By force of circumstances, management must have approached this latter result in many cases. There has been some experimentation, and certainly many employers have been fairly free to experiment. If shortening or lengthening existing periods would increase efficiency, such a change would provide that advantage over one's competitors for which shrewd management is ever on the lookout. There must be, therefore, a constant stimulus to try longer or shorter hours, and it might be reasonably concluded that where no arbitrary force sets hours, their level at a given time may represent, approximately at least, the most efficient adjustment under existing circumstances. There are, of course, many exceptions.

Disutility of long hours. Another constantly effective though generally ignored tendency should be mentioned in any serious and thorough consideration of factors affecting working hours. That is the fact that employers are always under constant pressure to reduce hours because of the more or less unconscious reluctance of employees to work longer

than they regard as necessary, that is, the tendency of each worker to regard each additional hour given to an employer as worth more than those already given. The principle involved is essentially that of marginal utility, and its reality is unquestionable. The worker is glad to work what he regards as a minimum number of hours per day or per week. He works a few hours more than that without serious objection. But if he is called upon to work still longer, he values additional hours more highly, as is clearly evidenced by the established practice of paying premium wages for overtime. Thus, the employer buys labor at a higher price as he extends its hours, and he is constantly constrained, for this reason, to restrict hours to the end that he may purchase it more cheaply.

Analysis of working hours. It is the primary function of personnel administration, so far as hours are concerned, to discover what lengths of day, week, and year result in the most efficient use of labor. This objective may be achieved by different means.

In many cases, attention to past experience with different lengths of working days or weeks will prove suggestive as to the most favorable arrangements. Certain periods representing different hour-schedules may be compared as to such measures of workers' performance as totals or averages of production, tardiness, absence, accident rates, and any other features that may be regarded as significant. Frequently, the implications of such comparisons will be obvious. If it is desired to measure interrelationships, the techniques of correlation described in preceding chapters will prove helpful.

Correlation of tabulated data. Where a number of different arrangements are to be compared, it may be desirable to make use of somewhat more complicated methods of correlation analysis than those described in earlier chapters. One such device is the correlation table, illustrated in Example 13, where weekly rates of absenteeism are compared with weekly working hours to discover to what extent, if any,

increased absenteeism accompanies extensions in the length of the working period.

In the example the experience of two years, 100 working weeks, has been analyzed, first to divide the various lengths of work week into 5 classes, and second to classify rates of tardiness (Y) in 6 classes. These two classifications have then been combined to provide a simple tabulation or correlation table. The numbers of classes may, of course, be varied, and they should be selected to represent the data fairly. Generally, more classes will be utilized, but the number is intentionally reduced to a minimum here to facilitate explanation of the method. Ordinarily, the variable that is regarded as independent is plotted on the horizontal, X -scale, and the dependent is plotted on the Y -scale, and it is customary, also, to range the data in ascending values from left to right and from top to bottom. Such an arrangement helps to provide a picture of the relationship. Thus, if data cluster about a line running upward from left to right, then the correlation may be immediately recognized as positive, while if they cluster about a line running upward from right to left, the relationship is negative.*

*The procedure involved in use of the correlation table may be summarised briefly as follows: After classes have been labeled, items are checked in their appropriate cells, and the number of items in each cell is noted. Total frequencies in each row and each column are then recorded in f_r and f_c columns and rows. One class is selected as the arbitrary origin (R) for each series, and other classes are designated as deviations from that origin, as shown in d_r and d_c columns and rows. These deviations are multiplied by the frequencies of appropriate rows and columns to secure the products listed under $f(d_r)$ and $f(d_c)$ headings. Then, these products are multiplied by the deviations to secure $f(d_r^2)$ and $f(d_c^2)$. The next step represents the only complicated part of the procedure. It involves multiplication of the frequency characteristic of each cell by the appropriate deviation of its column, d_c , and the summing of these products to provide the totals, $\Sigma f_r d_c$ shown in the column under that label. The same procedure is then applied to each column to secure the totals shown in the row $\Sigma f_c d_r$, whose title means the total of products of frequencies in each cell multiplied by the deviations represented by the row in which the cell appears. These totals are then multiplied by the row and column deviations as indicated to provide the data for the final column and row. Symbols in parentheses identify the totals for their respective rows and columns.

The process provides several obvious checks on these operations; as is

EXAMPLE 13
THE CORRELATION TABLE

Data: X, weeks of employment, classified according to length in hours; Y, rates of tardiness for each week, calculated as the number of times tardy per hundred starts; R_x and R_y , arbitrary origins.

Y	Class Limits	Class Marks	X						f_r	d_y	$f(d_y)$	$f(d_y^2)$	$\Sigma f d_x$	$\Sigma f d_x d_y$	
			20-25	25-30	30-35	35-40	40-45	45-50							
			22.5	27.5	32.5	37.5	42.5	47.5							
.8-1.0	.9		1	2	3	5	5	4	20	2	40	80	+3	6	
.6-.8	.7		2	2	4	4	5	8	25	1	25	25	+7	7	
.4-.6	.5		4	4	5	7	1	4	25	0	0	0	-16	0	
.2-.4	.3		5	6	4	3	1	1	20	-1	-20	20	-28	28	
0-.2	.1		5	1	1	1	1	1	10	-2	-20	40	-15	30	
	f_c		17	15	17	20	13	18	100		125	165	-49	71	
	d_x		-3	-2	-1	0	1	2							
(Σd_x)	$f(d_x)$		-51	-30	-17	0	13	36	-49						
(Σd_x^2)	$f(d_x^2)$		153	60	17	0	13	72	315						
(Σd_y)	$\Sigma f d_y$		-11	-2	+4	+9	+12	+13	25						
$(\Sigma d_y d_x)$	$\Sigma f d_y d_x$		+33	+4	-4	0	12	26	71						

Summary: $R_x = 37.5$; $i_x = 5$; $R_y = .5$; $i_y = .2$

Coefficient of correlation (all manipulations in class interval units):

$$\sigma_x = \sqrt{\frac{\sum d_x^2}{n} - \left(\frac{\sum d_x}{n}\right)^2} = \sqrt{\frac{315}{100} - \left(\frac{-49}{100}\right)^2} = \sqrt{3.15 - .24} = \sqrt{2.9099} = 1.708$$

$$\sigma_y = \sqrt{\frac{\sum d_y^2}{n} - \left(\frac{\sum d_y}{n}\right)^2} = \sqrt{\frac{165}{100} - \left(\frac{25}{100}\right)^2} = \sqrt{1.65 - .0625} = \sqrt{1.5875} = 1.25995$$

$$\Sigma xy = \Sigma d_x d_y - \frac{(\Sigma d_x)(\Sigma d_y)}{n} = 71 - \frac{-49 \times 25}{100} = 71 - \left(\frac{-1225}{100}\right) = 71 + 12.25 = 83.25$$

$$r = \frac{\Sigma xy}{n\sigma_x\sigma_y} = \frac{83.25}{100(1.708)(1.26)} = \frac{83.25}{215.5} = .386$$

Measures of the distribution:

$$M_x = R_x + \left(\frac{\sum d_x}{n}\right)i_x = 37.5 + \left(\frac{-49}{100}\right)(5) = 37.5 - 2.5 = 35.05$$

$$M_y = R_y + \left(\frac{\sum d_y}{n}\right)i_y = .5 + \left(\frac{25}{100}\right)(.2) = .5 + .05 = 0.55$$

$$\sigma_x = \sigma_{x^2} = 1.708 \times 5 = 8.540$$

$$\sigma_y = \sigma_{y^2} = 1.26 \times .2 = 0.2519$$

Definition of the regression:

$$b_{yx} = r \frac{\sigma_y}{\sigma_x} = .386 \left(\frac{.252}{8.54}\right) = 0.0114$$

$$a = M_y - bM_x = .55 - (.0114 \times 35.05) = .55 - .3996 = 0.1504$$

$$T = .1504 + .0114X.$$

Check (where σ_y is expressed in class interval units):

$$\frac{b_{yx}\Sigma xy}{i_y n \sigma_y^2} = r^2; \frac{(.0114)(5)(83.25)}{(.2)(100)1.25995^2} = \frac{4.74525}{31.75} = 0.1495$$

$$r^2 = .38602^2 = 0.1497$$

Possible adjustments in working hours. As a result of careful analysis, it is likely that adjustments in the arrangement of working hours for all or for special groups of workers may appear highly desirable. In some instances, such adjustments will merely vary the usual daily working hours. Many experiences with such variations have been made the subject of investigation and reports. In some cases, net or total production appears to have been increased by reducing daily hours or weekly periods. In others, the opposite result prevails. Sometimes the length of the day may remain unchanged, but the work week may be reduced or extended. Apparently, with available information, prediction of the probable results of such changes is exceedingly hazardous. The best basis for judgment is probably the past experience of the particular firm or plant.¹⁰

In other cases, the adjustment may change both hours per day and days per week. Again, however, it is necessary to experiment and to analyze earlier experience in order to predict probable effects of such adjustment. Many firms have found the shorter work week highly satisfactory, but that does not mean that the reduction can be counted upon to increase efficiency or can be carried to extremes with continually improved productivity.¹¹

shown by the identity of totals for several columns and rows. Measurement of correlation is effected without reducing the data from class interval units, as shown in the second portion of the example. If it is desired to use the measure for predictive purposes, definition of the regression requires that the data be reduced to original units, and that result is obtained in the section described as "Measures of the Distribution." A final operation provides a check on the whole procedure and will be found especially useful.

The coefficient thus secured may be corrected for sampling errors in the usual manner, and it may be readily evaluated as to significance by reference to its standard error or to the charts in Appendices G and H.

¹⁰ See, for instance, Best, Ethel L., *A Study of a Change from 8 to 6 Hours Work*, Washington, Bulletin of the Women's Bureau, No. 105, 1933; Vernon, H. M., "Reduction in Hours of Work," *Human Factor*, May, 1935, pp. 219-226.

¹¹ See, Metropolitan Life Insurance Company, "Five Day Week in Industry," 1931; Moulton, Harold G., and Leven, Maurie, *The Thirty Hour Week*, Washington, the Brookings Institution, 1935; *Five-Day Week in Industry, Statement of Fact and Opinion*, Princeton, Industrial Relations Section, Princeton University, 1929; "Thirty Hours," *American Federationist*, December, 1935, Vol. 42, No. 12, p. 1284.

Holidays and vacations. Where holidays are to be observed, it is generally desirable that employees should be made aware of that fact as far in advance as possible, and a similar policy is desirable with respect to vacations. The provision of vacations with pay is becoming increasingly common in American industry, and, whereas formerly they applied mainly to office employees, now they are being extended to include non-office workers. A survey in 1930 indicated that the industries that were taking the lead in this direction were chemicals, foods, rubber, printing, clothing, and paper, and the movement appeared to have gained greater support in large plants than in small ones. Usually, participation in the vacation arrangements requires at least one year's service on the part of the worker.¹²

Overtime. One of the most commonly troublesome aspects of working hours is that which involves overtime work. Careful studies have shown that overtime is generally considerably more expensive, as far as labor costs are concerned, than regular employment, and they indicate, also, that employees object to overtime in spite of the general practice of compensating for it with premium wages. Productivity is generally reduced in both overtime and regular work periods when overtime work is anticipated, so that its entire aspect is difficult to evaluate. Its expense makes it a fruitful field for investigation, because there is promise of genuine savings in any plan that effects its reduction.

Night work. Night work is subject to many of the objections noted in connection with overtime. It is usually expensive, as far as labor costs are concerned, and unless it is essential, as is the case where production must be a continuous process, it is generally undesirable from the point of view of efficient use of labor. Workers, as a whole, object to it, and few of them appear to be as efficient during night-hours as during daytime.¹³

¹² See, "Vacation Policies in Manufacturing Industries," *Industrial Bulletin*, Albany, N. Y., New York State Department of Labor, December, 1930, Vol. 10, No. 3, pp. 76-78; "Vacation Practices and Policies in 1932," New York Merchants Association of New York, June 21, 1932.

¹³ See, *Night Work in Industry*. New York: National Industrial Conference Board, 1927.

Sunday employment. In some cases, employment on Sunday is essential and is taken as a matter of course. Where it is not so established, however, it is to be avoided if possible, both because efficiency is lowered on the Sundays when work is attempted and because there is a strong tendency for Sunday employment to affect performance adversely during adjacent work days. Absenteeism is increased, as is a general slowing of the whole production process.

Rest pauses. No phase of the question of hours has received more attention in recent years than that concerning the value of rest periods, introduced during ordinary working hours to reduce fatigue and encourage relaxation. The idea is akin to the established practice of recessing the public schools twice daily, and the most common arrangement provides a ten or fifteen minute pause in mid-morning and mid-afternoon. The belief in the efficacy of this system is based upon a growing recognition of the fact that fatigue slows production and encourages accidents and spoilage.

It must be emphasized, however, that no patented system of rest periods can be expected to meet the needs of all types of industry and business. Rest pauses, if they are to be used at all, must be adapted to the special needs of the workers involved and the peculiar conditions of production. A proper arrangement requires, first of all, careful examination of the performance of individual workers to note when effects of fatigue appear in that performance. Perhaps performance per hour or per half-hour period may be measured for the whole group, in order to discover when the tapering process begins. Presumably, it is at this point that a rest might prove beneficial. Experimentation will have to indicate how the pause should be used and what provisions need be made for rest and recreation. In some cases, employees merely cease work and move about freely. In others, they are provided with facilities where they may sit comfortably, smoke, chat, or read.

Evaluation of the effects of such pauses is a complicated

process. Maximum effects frequently do not appear for some time, until employees have had an opportunity to make their personal adjustments to the new arrangements. In many cases, effects are noted in the work period preceding the pause as well as that which follows. The whole work day must be considered in such evaluation, for it is frequently found that the institution of formal rest pauses tends to reduce or prevent individual rest pauses taken by workers on their own initiative. It is recognized that, if no formal rest periods are provided, employees are likely to make their own pauses if that is possible. Sometimes, such pauses interfere seriously with the work of others, so that the provision of a single pause affecting all employees in a single shop or division may greatly advance over-all efficiency.

Questions as to the need for and efficacy of rest pauses are closely related to those of interest and are given additional consideration in that connection in Chapter XVII (see pages 394 to 395).¹⁴

In comparing performance with and without various rest pause arrangements, care must be exercised to the end that interpretations are justified by the facts. Where multiple conditions affect performance, or where the latter fluctuates widely under what are regarded as normal conditions, changes in efficiency must be marked and definitive to be regarded as reliable indicators of causal relationship. All of the statistical techniques described in preceding chapters may, therefore, be effectively utilized in the evaluation of changes.

Exercises and Problems

1. Prepare a brief report on one of the articles and studies mentioned in footnotes throughout the chapter.

¹⁴ See, also, Shepard, George H., "Effect of Rest Periods on Production," *Personnel Journal*, October, 1928, Vol. 7, No. 3, pp. 186-202; *Investigation of Rest Pauses, Working Conditions, and Industrial Efficiency*, New York, Western Electric Company, 1929; Wyatt, S., *Studies in Repetitive Work with Special Reference to Rest Pauses*, London, Fatigue Research Board, Report No. 32, 1925.

Hours of Work

2. A manufacturing establishment is concerned with the effect of changes in the length of working hours upon production per hour among all its employees. From available data, the tabulation summarized below has been prepared. Analyze the data to discover the average production per man-hour in all plants under each of the three arrangements. Recognizing the limitations of the data, which have been reduced for problem purposes, discover whether the difference between the averages appears to be statistically significant.

Plant	Man-Hours (in thousands)	Production in Units per Man-Hour		
		10 Hour Day	8 Hour Day	6 Hour Day
A	12	5.5	5.8	6.0
B	10	4.5	4.4	5.0
C	3	3.5	3.6	4.0
D	6	3.3	3.5	3.8
E	9	3.9	4.0	4.2

3. Given: The following data with respect to the X Company's No. 3 plant, including daily hours of employment, accident frequency rates, and avoidable separation rates for several periods for which these data are available:

Period	Hours	Accident Frequency Rates	Avoidable Separations
		Y_1	Y_2
1	6	6.0	11
2	8	10.0	13
3	5	11.0	14
4	14	13.0	4
5	15	8.0	9
6	11	12.0	5
7	13	14.0	1
8	12	15.0	3
9	10	9.0	2
10	7	2.0	15
11	9	3.0	7
12	4	4.5	8
13	2	4.5	6
14	1	1.0	12
15	3	7.0	10

(a) Measure the correlations between hours and frequency rates and between hours and avoidable separations, and evaluate the significance of each.

(b) Estimate probable accident frequency rates for a day of 9.5 hours.

(c) Estimate the probable separation rate for a day of 9.5 hours.

(d) Calculate the standard errors of each estimate and chart the relationship, showing these errors.

4. Construct a correlation table and evaluate the relationship between test scores and ratings summarized in exercise 4 of Chapter VIII.

Predict the rating for an individual whose test score is 75 and note the standard error of estimate.

Collateral Reading

- Baridon, Felix E., and Loomis, Earl H., *Personnel Problems*, Chaps. VII and XI. New York: McGraw-Hill Book Company, Inc., 1931.
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- Hoopingarner, Dwight Lowell, *Labor Relations In Industry*, Chap. XVII. New York: McGraw-Hill Book Company, Inc., 1925.
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CHAPTER XII

Service Rating

IT is probable that no personnel practice is more constantly utilized and at the same time more generally unsatisfactory than service rating. Everywhere, both in large concerns and in small, management looks to ratings as an important tool, and almost everywhere, when ratings are carefully analyzed, they are found to be highly questionable in validity. The reasons for this situation may be best understood by a careful consideration of service ratings, with special reference to their purposes or objectives, the types of ratings that are generally used, the most commonly rated features, usual rating procedure, and the limitations inherent in the rating process. It is the purpose of this chapter to describe these major aspects of service ratings in industry.

Purposes of service ratings. Employees are rated, it may be said at the outset, because there are many characteristics of such employees the measurement of which seems important to management but for which there are no objective measures. Certain types of human qualities, of which initiative, persistence, leadership, self-control, perspective, and appearance are fairly representative, may be quite important to successful performance in particular positions. Management is interested in their presence or absence in those who seek or occupy these positions. But there are few if any objective standards or tests available to provide a quantitative measurement of these characteristics. It is necessary, therefore, to rely on judgments and opinions. Ratings and rating procedure have been developed to provide a convenient method of obtaining and recording these

judgments. If these features cannot be definitely weighed or measured, they can at least be compared; it is possible to agree that a given individual exhibits more or less of a certain quality than do specified other individuals.

The basic purpose of rating is to secure comparisons of this type. It seeks to secure a quantitative measurement of qualities that are not objectively measurable. It attempts to provide a quantitative comparison of the degree in which certain qualities are present in different individuals, in spite of the fact that there are no objective units by which to measure these qualities. It recognizes that there are no units for character, poise, capacity for executive development, and other such characteristics, but it seeks, in spite of this difficulty, to provide a measurement of the degree to which such features are present in the personalities of individual employees.

The purpose just described is, of course, the general or underlying purpose of rating. Specific purposes, the reasons for which ratings are desired, the uses to which they are to be put, are numerous and varied. They may be used, for instance, to encourage major and minor executives to avoid general judgments of employees and to consider, rather, the relative presence or absence of what are regarded as important specific qualities in these employees. In other words, management uses ratings to force those who are in supervisory positions to regard subordinate employees in terms of particular traits possessed in varying degrees by the latter, rather than to regard them merely as "good men," "a little weak," or in some other general and relatively meaningless category.

In some cases, *rating scales*, the term applied to forms on which ratings are recorded, are used to stimulate careful interviewing procedure and to record impressions gained in interviews. By calling attention to specific characteristics to be noted in the interview, they thus encourage a more concrete, detailed evaluation of the individual than is available from the usual "general impression" gained in the inter-

view. Obviously, only the relatively external, impressionistic features of the interviewee can be rated in the ordinary interview.

Ratings are frequently utilized as a basis for advice that may be given employees on ways in which they may increase their value to the organization. In such cases, personal deficiencies discovered by comparative ratings are called to the attention of the ratee, with suggestions as to how he may improve and overcome such shortcomings. Frequently, ratings may disclose the general need for training programs, where certain types of deficiency are found to characterize a large number of employees.

Possibly the most common use of ratings is that in which those who are responsible for personnel policies utilize ratings as bases for selection or distinction among employees, as the latter are considered in relation to various changes or developments in the personnel program. They may be used to differentiate between those who are and those who are not to be promoted, or, if business conditions make such action necessary, those who are to be demoted. Similarly, they may define those who should be transferred, or those selected for training, or those to be laid off. Where wage increases or decreases are in order, they too may be distributed according to ratings.

Types of rating. An almost endless variety of rating scales is in use in industry today, and there is little apparent trend toward standardization among them. Various systems for recording merits and demerits of individual workers have long been utilized. Walters says that one of the first rating devices was the system of "character books" instituted by Robert Owen in his New Lanark Cotton Mills in Scotland. Each employee had such a book in which his daily reports were recorded, and each was also provided with a character "block," each side of which was colored differently and represented an evaluation of the employee ranging from bad to excellent. The blocks were displayed on the worker's bench. Karl Pearson devised a rating scale for

intelligence in 1906, and the Scott *Man-to-Man* scale was first given wide use at the time of the World War. Rugg experimented with this scale, and his criticisms provided numerous suggestions for the improvement of such measures. Almost all managements have, at one time or another, sought to record impressions of certain types or groups of workers, and, as a result, the varieties of rating scales that have been utilized are numerous.¹

Current rating procedure may be conveniently regarded, for purposes of more detailed description and classification, from two quite different points of view. It may be classified according to the position of the rater with respect to that of the ratee, and it may be distinguished according to the form of the rating scale.

Position of the rater. There are two major types of rating procedures, as far as the positions of rater and ratee are concerned. In one of them, employees are asked to rate themselves or to submit to rating by their fellow workers. Sometimes, they are given a scale and asked merely to evaluate themselves in terms of the characteristics mentioned. Or each employee may be asked to rate one or more of his fellow workers on a given scale. Best known of such rating devices is the Scott *Man-to-Man* scale, which was used during the World War in officer training camps. Young officers were asked to rate themselves and a specified number of their colleagues as to physical characteristics, intelligence, leadership, personal qualities, and general value. Each rater was to name his ratees in order from the one he regarded as most promising to the man regarded as least promising with respect to each of these features.

Mutual rating is somewhat similar, although it may not involve recorded direct comparisons of one man with another. Rather, several employees are given scales and each man is asked to rate all the others on the scale, with the

¹ See, Pearson, Karl, "On the Relationship of Intelligence to the Size and Shape of the Head," *Biometrika*, 1907, Vol. 5, pp. 105-106; Rugg, H. O., "Is the Rating of Human Character Practical?" *Journal of Educational Psychology*, 1921, Vol. 12, pp. 425-438, 485-501, 1922, Vol. 13, pp. 30-42, 81-93.

understanding that results are to be regarded as highly confidential. Such rating is generally described as *horizontal*. It is to be distinguished from *vertical* rating, in which employees are rated by their superiors. In such arrangements, foremen rate regular employees; supervisors or department heads rate foremen, and the process continues on up to the higher ranking executives. Vertical rating is the more common of the two.

Forms of scales. One of the simplest forms of rating scale is that usually described as the "order-of-merit" or *Man-to-Man* scale mentioned above. In it, each rater ranks his ratees for each quality mentioned by the scale. Thus, for leadership, he may rank them: (1) Jones, (2) Smith, (3) Brown, and so on; while for appearance he may rank them: (1) Smith, (2) Jones, (3) Brown. The scale is limited in usefulness by the difficulty of comparing ratings of the same person by different raters. Since each rater's scale is complete within itself and he merely ranks individuals with respect to each other, comparisons of ratings are not facilitated.

Another simple form is the "yes and no" type of scale. It merely asks questions to which the rater is supposed to answer. Thus it may ask, "Is the ratee punctual?" or "Is the ratee honest?" Limits upon the usefulness of such a scale are obvious.

One of the most common forms of scales is that which may be described as numerical or percentage in nature. It lists a number of qualities and asks the rater to indicate the quantity or percentage of each which he believes to be present in the ratee. Sometimes, instead of percentages, letter grades are utilized, and raters are asked to grade each quality as A, B, C, and so on. Such a scale is illustrated in Figure 21. In many cases, simple linear scales are substituted for numerical or letter measurements. Qualities are named at the left extreme, and raters are asked to check along the line at the point representing the measure of the ratee.

More frequently, such linear scales are supplemented by

Name		Position	Location	Rating as of
				19
Encircle rating figure for each quality: 5 Excellent, 4 Good, 3 Average, 2 Fair, 1 Poor				
QUALIFICATION	RATING	RATER	COMMENTS	REVIEWER
I S	Ambition	5 4 3 2 1		
	Character	5 4 3 2 1		
	Education	5 4 3 2 1		
	Health	5 4 3 2 1		
	Loyalty	5 4 3 2 1		
	Outside Interests	5 4 3 2 1		
Personality	5 4 3 2 1			
KNOWS	Present Activity	5 4 3 2 1		
	Other Activities	5 4 3 2 1		
	Procedure and Policy	5 4 3 2 1		
DOES	Accepts Responsibility	5 4 3 2 1		
	Application	5 4 3 2 1		
	Attendance	5 4 3 2 1		
	Care and Exactness	5 4 3 2 1		
	Cooperation	5 4 3 2 1		
	Expression	5 4 3 2 1		
	Follows Instructions	5 4 3 2 1		
	Housekeeping	5 4 3 2 1		
	Initiative	5 4 3 2 1		
	Intelligence	5 4 3 2 1		
	Judgment	5 4 3 2 1		
	Rate of Work	5 4 3 2 1		
	Sense of Economy	5 4 3 2 1		

Fig. 21.—Simple Numerical Rating Scale.

FORM NO. 612 EN 8-25 1953		STATE OF MINNESOTA				DEPARTMENT OF HIGHWAYS			
NAME		TITLE				CLASS OF WORK		DATE	
QUARTERLY RATING REPORT—EMPLOYMENT RECORD									
NO.	SUBJECT	EXCEPTIONAL—10	ABOVE AVERAGES—8	AVERAGE—6	BELOW AVERAGE—4	POOR—2	Do Not Use This Column		
1	HEALTH	ROBUST	VIGOROUS	GOOD	FRAIL	SICKLY			
2	KNOWLEDGE	COMPLETE	VERY GOOD	AVERAGE	MEAGER	INADEQUATE			
3	INITIATIVE	EXCELLENT	VERY GOOD	FAIR	POOR	NONE			
4	SPEED	VERY RAPID	RAPID	AVERAGE	SLOW	VERY SLOW			
5	ACCURACY	EXCEPTIONAL	ACCURATE	AVERAGE	INACCURATE	CARELESS			
6	RELIABILITY	EXCEPTIONAL	DEPENDABLE	SATISFACTORY	IRREGULAR	UNRELIABLE			
7	JUDGMENT	EXCEPTIONAL	VERY GOOD	ORDINARY	POOR	RASH			
8	INTEREST	ENTHUSIASTIC	INTERESTED	AVERAGE	INDIFFERENT	NOT INTERESTED			
9	CONDUCT	SPLENDID	VERY GOOD	AVERAGE	POOR	TRoublesome			
10	SELF-CONFIDENCE	EXCEPTIONAL	VERY GOOD	AVERAGE	POOR	TIMID			
OTHER QUALIFICATIONS							THIS COLUMN FOR CENTRAL OFFICE USE ↓ TOTAL		
OTHER DEFICIENCIES									
SIGNATURE ENGINEER IN CHARGE				SIGNATURE OF ANOTHER PARTY					
SEE INSTRUCTIONS ON REVERSE SIDE									

55
54

Fig. 22.—Modified Linear Rating Scale.

simple descriptive words or phrases. Thus, under the line for health, the words "excellent," "average," and "poor" may be placed at equally spaced intervals, or judgment may be described as "exceptional," "very good," "ordinary," "poor," or "rash." In some cases, the varying degrees thus defined are given numerical weights. In others, no such quantitative values are involved. A commonly used scale of this type is illustrated in Figure 22.

Because of the fact that raters tend to attach different meanings to qualities that are simply named, many rating scales have sought to avoid this difficulty by defining each such characteristic in some detail. The federal government, for instance, in securing its semiannual ratings for members of its classified services, has used the scale shown in Figure 23, where each quality is defined rather extensively.

Similarly, in order to overcome the tendency of raters to vary in their quantitative appraisal of the presence of various features, recently developed scales have frequently described varying degrees in detail. Thus, as shown in the rather unusual form pictured in Figure 24, each quality may be described by a series of phrases representing various degrees, so that raters tend to arrive at common standards in appraising each feature.

Finally, several of the most effective of recently developed forms tend to check the judgment of raters by requiring them to describe each characteristic rated in terms of objective behavior. One such form lists each quality separately and requires the rater to substantiate the score by reference to some illustrative incident. Others have sought to attain a similar objectivity by describing various degrees of the features in objective terms rather than as average, medium, or exceptional, or by merely asking for evidence of unusual positive or negative value.

Desirable features. The most successful ratings in use today combine a number of these features. They provide linear scales for each quality to be rated. When the various points checked on each of the lines are connected, they pro-

CLASSIFICATION SYMBOLS		
SERVICE	GRADE	CLASS

GRAPHIC RATING SCALE

(SEE INSTRUCTIONS ON REVERSE SIDE OF SHEET)

NON-SUPERVISORY _____ (CHECK ONE)
 SUPERVISORY _____

Name _____ Department _____
(Surname) (Given name) (Initial)

_____ (Division) (Section) (Subsection)

256

ELEMENT NUMBER	SERVICE ELEMENTS	NOTE: MARK ONLY ON ELEMENTS CHECKED IN LEFT-HAND MARGIN					DO NOT USE SPACE BELOW
<input type="checkbox"/>	1 Consider accuracy; ability to produce work free from error; ability to detect errors.	Highest possible accuracy.	Very careful.	Careful. No more than reasonable time required for revision.	Careless. Time required for revision greatly excessive.	Practically worthless work.	
<input type="checkbox"/>	2 Consider reliability in the execution of assigned tasks; dependability in following instructions; accuracy of any parts of product appraisals in terms of accuracy.	Greatest possible reliability.	Very reliable.	Reliable.	Doubtful reliability.	Unreliable.	
<input type="checkbox"/>	3 Consider neatness and orderliness of work.	Greatest possible neatness and orderliness.	Very neat and orderly.	Neat and orderly.	Disorderly.	Slovenly.	
<input type="checkbox"/>	4 Consider the speed or rapidity with which work is accomplished; the quantity of work produced in a given time; the dispatch with which a task of known difficulty is completed.	Greatest possible rapidity.	Very rapid.	Good speed.	Slow.	Hopelessly slow.	
<input type="checkbox"/>	5 Consider industry; diligence; attentiveness; energy and application to duties; the degree to which the employee really concentrates on the work at hand.	Greatest possible diligence.	Very diligent.	Industrious.	Inattentive to work.	Lazy.	
<input type="checkbox"/>	6 Consider knowledge of work; general knowledge of job and of work related to it; specialized knowledge in his particular field.	Completely informed.	Unusually well informed.	Well informed.	Poorly informed.	Lacking	
<input type="checkbox"/>	7 Consider judgment; ability to grasp a situation and draw correct conclusions; ability to profit by experience; sense of proportion or relative values; common sense.	Perfect judgment.	Excellent judgment.	Good judgment.	Poor judgment.	Neglects and misinterprets	

20
20

<input type="checkbox"/> 8	Consider success in winning confidence and respect through his personality; courtesy and tact; control of emotions; poise.	Impulsive.	Usually pleasing.	Placid.	Wise.	Repetitive.
<input type="checkbox"/> 9	Consider cooperativeness; ability to work for and with others; readiness to give new ideas and methods a fair trial; desire to observe and conform with the policies of the management.	Greatest possible cooperativeness.	Very cooperative.	Cooperative.	Efficient to leaders.	Obstructive.
<input type="checkbox"/> 10	Consider initiative; resourcefulness; success in doing things in new and better ways and in adopting improved methods to his own work; constructive thinking.	Greatest possible originality.	Very resourceful.	Progressive.	Hardly suggests.	Needs detailed instruction.
<input type="checkbox"/> 11	Consider execution; ability to pursue to the end difficult investigations or assignments.	Completes assignments in shortest possible time.	Completes assignments in unusually short time.	Completes assignments in a reasonable time.	Slow in completing assignments; or does not complete assignments.	Takes excessively long and accomplishes little.
<input type="checkbox"/> 12	Consider organizing ability; success in organizing the work of his section, division, or department, both by delegating authority wisely and by making certain that results are achieved; ability to plan so as to complete tasks on schedule.	Highest possible effectiveness.	Effective under difficult circumstances.	Effective under normal circumstances.	Lacks planning ability.	Inefficient.
<input type="checkbox"/> 13	Consider leadership; success in winning the cooperation of his subordinates and in leading them into a loyal and effective working unit; decisiveness; energy; self control; tact; courage; fairness in dealing with others.	Most capable and forceful leader possible.	Very capable and forceful leader.	Capable leader.	Fails to command confidence.	Antagonizes subordinates.
<input type="checkbox"/> 14	Consider success in improving and developing employees by imparting information, developing talent, and arousing ambition; ability to teach; ability to explain matters clearly and comprehensively.	Develops employees to highest possible degree.	Develops very efficient employees.	Develops competent employees.	Fails to develop employees.	Discourages and demoralizes employees.
<input type="checkbox"/> 15	QUANTITY OF WORK (To be used only where accurate and comprehensive OUTPUT RECORDS are kept.)	Highest possible output.	High output.	Good output.	Low output.	Practically no output.
<input type="checkbox"/>						

On the whole, do you consider the department and attitude of this employee toward his work to be satisfactory? _____
 Answer "Yes," "No," or "Fairly so"

Rated by: _____ (Rating officer) Reviewed by: _____ (Reviewing officer) (Date) Total _____
 Final rating _____

Fig: 23.—Rating Scale of the Federal Classified Service.

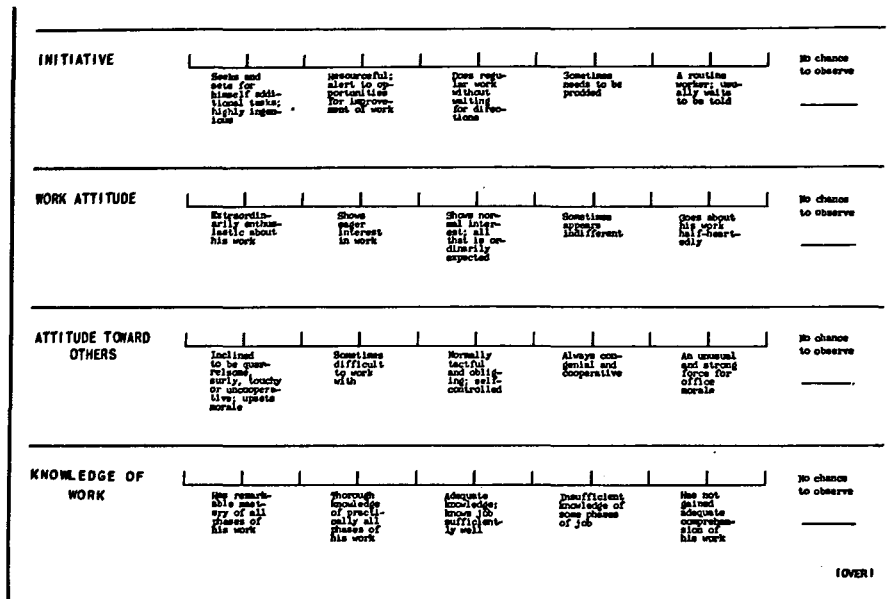



Fig. 24.—Scale Illustrating the Use of Descriptive Phrases.

Service Rating

vide a kind of chart of the ratee's characteristics, for which reason they are often described as *graphic, sky-line, or profile* scales. They name (and they may briefly define) each feature to be rated, and the best of them provide a statement

Check Columns			
1	2	3	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Active and strong
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Active but not strong
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Usually careless of personal appearance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Usually neat personal appearance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a pleasing voice and manner
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very tactful in dealing with the public
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Poor technical training for the work
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good technical training for the work
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Poor head work in sudden emergencies
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Good head work in sudden emergencies
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Often assigned to other important positions**
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Often assigned to fill a higher position**
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sometimes goes on a "tear"
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drink is one of principal failings
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Willing worker, but is not a leader
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does not plan or lay out work effectively
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plans work well but lacks snap in getting it done
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unusual ability in planning and laying out work; good organizer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Makes quick and accurate decisions
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Too lenient in maintaining discipline
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maintains good discipline
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lacks decision
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exceptionally skilful in handling difficult situations



These items are for supervisory or administrative positions only.

Fig. 25.—Excerpt from Probat Service Report.

of typical behavior illustrating each quality. Generally, they place descriptive phrases, rather than mere quantitative adjectives such as good, fair, or average, along the linear scale.

One of the most unusual rating scales is that developed by Mr. J. B. Probst. It seeks to avoid all interpretation by raters by asking specific questions that may be interpreted only by those who are in charge of the rating program. Subordinates first rank workers, after which superior officials check these ratings. Raters are instructed to express opinions only if they feel qualified to do so. The Probst system was originally developed as a means of rating public employees, but scales are available which may be used by private business concerns. A brief excerpt from one of the Probst scales is shown in Figure 25.²

Weighted scales. It is a common procedure, in using rating scales, to attach a numerical value to the rating on each quality and to total these values to provide a measure of the over-all rating of the employee. Ordinarily, each quality is given a maximum value of ten points, so that a scale listing ten characteristics would permit a possible score of 100 points. Recently, there has been a growing recognition of the fact that equal weighting of each quality may lead to almost worthless total ratings, if certain qualities are, from the standpoint of management, considerably more important than others. For this reason, many firms now weight individual characteristics differently. Thus, for instance, initiative may be given a maximum value of 20 points, while appearance has a maximum of ten.

The weights to be applied to different features must be determined upon as a result of careful study. Usually, conferences of executives may be relied upon to provide the decision as to comparative weights to be accorded to each feature. The rating process is complicated by this modification, but it may be made much more useful and reliable, and such great dependence is frequently placed on ratings

² Probst, J. B., *Service Ratings*, Chicago, Bureau of Public Personnel Administration, and Baltimore, Lord Baltimore Press, 1931. See also, Cowan, Donald R. G., "Improved Objective Standards of Sales Performance," *Journal of the American Statistical Association*, March, 1937, Vol. 32, No. 197, pp. 75-82.

that every possible improvement in their reliability deserves serious consideration.

Qualities rated. Baridon and Loomis⁸ have analyzed a large number of rating scales to discover what qualities are most frequently rated. They believe it possible to distinguish five major types of such qualities, including:

1. Performance.
2. Mental qualities.
3. Supervisory qualities.
4. Personal qualities.
5. Capacity for further development.

Each of these classes includes, of course, a variety of specific features. Thus, performance includes evaluation of both quantity and quality of work, while mental qualities include such features of inherent capacity as ability to learn, adaptability, and originality, together with such complex characteristics as judgment, knowledge, and level-headedness. Supervisory abilities most commonly rated include leadership—which is defined as including judgment of men, development of employees, and coöperative ability—and managerial ability, variously defined as organizing ability or coördinating ability. Numerous personal traits are listed in various scales, ranging from such inclusive features as character to specific minor traits, such as attitudes toward specific values.

If description of the scales may be interrupted to permit brief critical analysis, it may be indicated that while all kinds of characteristics appear on some scales, many of them have no place there. That is true, in many cases, of features evaluating performance on the job. In most cases, objective measures of performance in production, sales, number of contracts, or some other specific indication, are available. These objective measures are, in such cases, obviously more reliable than any supervisor's impression of quantity. The same criticism may be made of the inclusion of such features

⁸ Baridon, F. E., and Loomis, Earl H., *Personnel Problems*, pp. 193-194. New York: McGraw-Hill Book Company, Inc., 1931.

as length of service, punctuality, absence, and, in many cases, such items as speed, accuracy, and knowledge. Certainly, whenever there are objective measures defining a certain quality, they are to be preferred. In some cases, such objective measures may be utilized in evaluating the reliability and value of the ratings, but there is little to be gained by asking raters to express an opinion upon them, unless they assist raters in evaluating other qualities.

The guiding principle in determining what qualities are to be included in the rating scale is the purpose for which ratings are to be used. In general, it is important that only traits which are present in varying quantities should be included, and only those which are pertinent to the uses to which ratings are to be put. Finally, rating is not to be made of a quality for which an objective measure is available unless this rating is supplementary to and a means of assisting in rating other features. These considerations provide effective criteria for evaluating or constructing any scale.

Rating procedure. In instituting a rating program, preliminary steps include selection of groups (in terms of occupations, divisions, departments, salary ranges, or other criteria) that are to be rated, and the careful definition of the purpose or purposes for which ratings are to be secured. Also, it must be decided at the outset who shall do the rating. Each of these considerations is highly important to all the steps that are to follow. Groups to be rated must be clearly defined, as must purposes of rating, before subsequent questions can be intelligently answered.

Those who are to do the rating must be carefully selected. If supervisors or department heads are to do it, they must be sufficiently close to the ratees to know them. They must be both willing and able to cooperate in the project. Possibly the most common difficulty arises out of the fact that the rater does not know all ratees well but hesitates to admit the fact. It is much better that no rating be made in such cases, however, and raters should be aware of that possibil-

ity. The use of traveling raters, unknown to ratees and able to obtain only a casual impression in a short period of interviewing or observation, is not at all satisfactory if ratings are to record anything more than the most casual impression.

The determination of qualities to be rated requires careful consideration. It is obviously directly dependent upon the nature of groups to be rated and the purposes of rating. An elementary principle holds that qualities should be such that they appear in varying degrees among those to be rated. Generally, it is desirable to secure a consensus of opinion as to what qualities are sufficiently important to justify rating. A group of executives, sitting together, can furnish suggestions, and experience will indicate others that should be included.

If widely different types of occupations are to be rated, it will be necessary to create more than one scale, for the same scale will not generally fit diverse groups. Just as different types of positions require distinctive abilities, so the rating of those who function in such positions requires different scales. Scales for supervisory and minor executive positions emphasize qualities of leadership, organizing ability, originality, initiative, tact, and other such traits, while those applied to operatives who have little or no executive responsibility tend to emphasize skill, industry, learning ability, personal appearance, ability to meet the public, willingness to cooperate, and similar features.

In determining qualities to be regarded as significant in the employees to be rated, it is important to distinguish between qualities for which no objective measure is available and qualities for which an objective measurement can be obtained. The latter should generally be excluded from the scale, even though they may properly be made a part of the employee's personnel record, unless, as has been noted, they materially assist the rater. The scale should consist only of non-measurable qualities regarded as important in the occupations to be rated.

The definition of each of the selected qualities is a job

requiring the greatest care and critical consideration. A simple dictionary definition is not at all adequate. The fact is that raters frequently have quite different impressions as to what constitutes each quality, as, for instance, leadership, initiative, or ability to learn. If ratings are to be consistent from one rating period to another, and from one rater to another, it is necessary that each quality be defined so specifically that all will have the same conception of it. In some cases, the quality may be described but not named, so that raters may avoid personal connotations that are at variance with the characteristic as it is defined in the rating scale. Thus, one scale, instead of simply asking raters to rate appearance, begins by asking this question, "How are you and others affected by his appearance and manner?" The use of questions is frequently preferred over the mention or description of qualities.⁴ The Probst scales already mentioned achieve something of this effect, since they ask raters to check positive answers to what are, in effect, individual questions.

Even better than a word definition of each quality to be rated is its definition in terms of objective behavior. In such an arrangement, the rater merely checks the behavior he believes to be associated with the ratee. Instead of expressing an opinion as to whether the ratee has 50 per cent or 75 per cent ability in leadership, on such a scale the rater chooses between such evidences of the presence or absence of leadership as are indicated by the fact that the ratee "lets others take the lead" or "sometimes leads in minor affairs" and other similarly objective measures of varying leadership. Sometimes, completed ratings involving these word-pictures of behavior typifying varying degrees of the qualities mentioned in the rating scale have been described as "behavior-grams" of those rated.⁵

⁴ Guilford, J. P., *Psychometric Methods*, p. 271. New York: McGraw-Hill Book Company, 1936.

⁵ The tendency of raters to mark various qualities hurriedly and carelessly is sometimes checked by reversing scales on different traits, running one in ascending order from left to right, another in descending scale, and

If traits to be rated are extremely difficult to describe in varying degree in terms of objective behavior, their presence or absence must then be described in carefully chosen phrases rather than merely as "good," "fair," "medium," or "excellent." Such terms are not consistently used by different raters nor by the same rater at different times. Sometimes, good results can be obtained by describing the relative quantitative presence of the quality as, for instance, "typical of the average individual," "found only in the best 10%," or "above average," "average," and "below average." In any case, more than five divisions are inadvisable, for most raters will be unable to distinguish more than that many degrees in the quality, and three divisions will frequently be adequate.

If lines are to be included, they may have the descriptive phrases beneath them. It is generally desirable that the lines have no breaks or divisions, and the scores to be attached to each degree should not be made a part of the form. Rather they should be prepared in stencil form and merely imposed upon the completed rating form by those in charge of rating. Scoring units should generally be the same as rating units, although the latter may in some cases be slightly broader.

Descriptive phrases may be distributed along the line, not necessarily at equal intervals, but rather according to the degrees they represent. In general, a middle or average point should be included, and care must be taken lest the end descriptions be so extreme as to prevent their use by raters.

Having selected, defined, and described the qualities to be rated, it must be decided as to whether all are to be given the same weights. Most common procedure weights them equally, but there is a distinct tendency to recognize the fact that the value of the rating scale is enhanced by a more

thus forcing close attention to each scale. Another method of achieving this result is the limitation of one quality to each page. It may be found desirable to rate all individuals on one characteristic first and then to rate all on the second, taking each feature separately.

careful procedure that weights qualities according to their relative importance on the job. ✓

Before any actual rating is undertaken, it is always desirable to train the raters. The objective of such training is to develop an impartial, objective approach to rating and to provide common standards. Raters may be encouraged to compare their ratings of each other, to note how a general impression of the ratee is apt to color the rating of individual traits, and thus to think of each trait independently and apart from the general impression of the ratee. They may be encouraged to compare scores on specific characteristics of identical ratees and thus to develop some uniformity in their evaluation.

Statistical analysis and interpretation. As soon as ratings have been made, it is necessary to check each rater's scoring tendencies and to note the usual errors of raters, in order to make ratings comparable. In part, such comparisons may be made by reference to several raters' scores on the same ratee. Frequently, it will be found that two raters will agree, in general, as to the type of person the ratee is, and the general pattern of their two ratings will correspond, although one will be generally higher throughout all traits than the other. This tendency results in what is described as the *systematic error* of the rater. One method of getting a measurement of this systematic error in scoring is to compare average ratings. One rater may frequently be found to have given an average total rating of 50, while another's may average 75. Unless there are marked differences between the whole group of employees rated by the first and that rated by the second, it must be assumed that the first rater tends to score much lower than the second. By careful analysis, it is frequently possible to calculate weights to be applied to each rater's scores whereby the work of various raters is made comparable. It is usually more satisfactory to so adjust total ratings than to attempt to reform the raters, although an effort should certainly be made in this direction, also.

Possibly the most satisfactory method of adjustment for differences among raters is one which first takes note of the *total error* of each rater and then further analyzes results by correcting for the rater's *systematic error* on each characteristic rated. To measure the total error for each trait, it is necessary first to discover the mean or average rating on that characteristic for all raters. This average may be designated as M . Then, the individual rater's rating on this trait for each ratee is noted and may be designated as R . The total error for each rater on the given trait is, then,

$$\text{T.E.} = \frac{\Sigma|R - M|}{n}$$

where individual errors are added without regard to sign, and n is the number of persons rated.

The systematic error on each trait is found similarly, as

$$\text{S.E.} = \frac{\Sigma(R - M)}{n}$$

where the errors are added algebraically, and n is again the number of persons rated.

Each rater's ratings may be readily corrected for the systematic error. If the latter is positive, then ratings must be adjusted downward. If it is negative, the reverse of this adjustment is prescribed.⁶

Two other common errors are those of *leniency* and *central tendency*. The first refers to the tendency of raters to hesitate at severe criticisms implied in adverse ratings, especially among those whom they know and like. The second, even more common, describes the general tendency to emphasize central or average ratings, especially for those whom they know only slightly and about whom they do not feel positive. If these tendencies have been carefully evaluated by detailed analysis of each item rated, the scales may

⁶See, also, Thorndike, E. L., "A Constant Error in Psychological Ratings," *Journal of Applied Psychology*, January, 1920, Vol. 4, No. 25, pp. 27-29.

be adjusted, or adjustment may be made in scoring stencils, to overcome them.

In general, the distribution of ratings on individual characteristics has been assumed to form a fairly normal distribution, and unless weights that are later applied result in skewness the total of such ratings will also take the normal shape. For that reason, raters may be assisted in evaluating their own work, if the number of ratees is sufficient, by reference to the expected distribution of ratings prepared by Symonds and summarized in Table VI. The table assumes that the range for 40 ratees is five standard deviations, and for 185 ratees it is six standard deviations.⁷

TABLE VI
PERCENTAGE OF CASES NORMALLY EXPECTED TO FALL WITHIN THE VARIOUS
CLASSES OF RATINGS^a

Classes	Three		Four		Five		Six		Seven	
	40	185	40	185	40	185	40	185	40	185
1	20	16	11	7	7	4	5	2	4	2
2	60	68	39	43	24	24	15	14	10	8
3	20	16	39	43	38	44	30	34	22	23
4			11	7	24	24	30	34	28	34
5					7	4	15	14	22	23
6							5	2	10	8
7									4	2

Another important test should be applied to all ratings, one which evaluates the *reliability* of the ratings. The individuals should be re-rated by the same raters after a short interval, an interval sufficiently brief so that the ratee cannot have changed greatly. Each rater's paired ratings of individual employees should then be correlated to discover

^aSee Ford, Adelbert, "Neutralizing Inequalities in Rating," *Personnel Journal*, April, 1931, Vol. 9, No. 6, pp. 466-469.

⁷Symonds, P. M., *Diagnosing Personality and Conduct*, p. 71, New York, D. Appleton-Century Company, Inc., 1931. Symonds' position has recently been challenged by Robert L. Hill, who finds a tendency to skewness in most rating. See "Efficiency Ratings," *Personnel Journal*, March, 1937, Vol. 15, No. 9, pp. 330-332.

whether or not they are consistent. If they do not provide a coefficient of correlation of at least $r = 0.75$, they cannot be regarded as reliable, and steps should immediately be taken to revise the definitions of qualities or other features of the scale or to improve or replace ineffective raters. Most branches of the government and many industrial and commercial organizations provide for ratings at regular three- or six-month intervals, so that such checks upon the reliability of ratings are readily available. Re-rating is an essential part of any rating program.

A final check on the *validity* and worth of any rating program is provided by comparison of ratings with some objective measures of performance on the part of employees who have been rated. In a sales organization, for instance, where amounts of sales represent an over-all measure of the value of an individual employee, sales and ratings may be correlated. Perfect agreement should not, of course, be expected, but if there is little or no correspondence between sales and ratings, then the value of the ratings must be seriously questioned. In other types of business, production totals may be available, or if wages reflect production, they may provide a useful criterion. In still other situations, ratings may be compared with measures of absence and tardiness, or with special bonuses, honors, and other marks of recognition for valuable service, and in other cases, two different ratings may be made and compared. No stereotyped practices prevail, but it is the constant objective of those in charge of personnel to secure evaluations of the ratings and indications of all shortcomings in rating procedure.

Limitations upon rating. Consideration of the limitations of rating procedure has purposely been reserved, both because it is necessary to have a clear picture of rating procedure before its limitations can be fully understood and because they are so important as to justify a position of emphasis. There is a dangerous tendency to place altogether

too great, too trusting, reliance upon ratings. They are so convenient, and they provide numerical, quantitative measures of what are otherwise complicated, heterogeneous, human personalities, that there is a strong tendency to regard them as perfect or at least as highly significant evaluations of employees. There are, however, many limitations that tend to restrict both their accuracy and their dependability, and it is quite important that these conditions be clearly understood. Ratings can be made a highly valuable tool, but their weaknesses must not be overlooked. A number of conditions must be fulfilled if ratings are to attain their greatest usefulness.

In the first place, social distance between rater and ratee is an important factor conditioning all rating. Obviously, the rater must know those he is rating, else he cannot judge their qualities. But if rater and ratee are too close, it may be quite impossible for the rater to attain the desired objectivity, if indeed, he may be expected to try. It is important, therefore, that each rater should know his ratees but not be so intimate as to allow favoritism to color his judgment.

It is generally agreed that dependence cannot be placed upon a rating by a single individual unless his experience is extensive and unless careful analysis of his ratings has shown him to be highly effective. Ordinarily, at least 3 ratings on each employee would be regarded as necessary to establish his rating, but no number of ratings is a guarantee of accuracy in the process. That can be assured only by careful checking on ratings and experience with raters.

It is also well recognized that the difficulties involved in rating increase with the importance of the position whose occupant is rated. It is more difficult to find satisfactory raters and to get joint ratings on executives, and it is also much more difficult to define, in recognizable objective behavior, the qualities that are important in such positions. Likewise, rating forms developed for one type of worker are seldom effective when applied to other occupational groups.

Name of student.....							
A. How are you and others affected by his appearance and manner?	|	|	|	|	|	|	No opportunity to observe _____
	Avoided by others	Tolerated by others	Liked by others	Well liked by others	Sought by others		
Please record here instances that support your judgment.							
B. Does he need constant prodding or does he go ahead with his work without being told?	|	|	|	|	|	|	_____
	Needs much prodding in doing ordinary assignments	Needs oc- casional prodding	Does ordi- nary assign- ments of his own accord	Completes suggested supplemen- tary work	Seeks and acts for himself additional tasks		
Please record here instances that support your judgment.							
C. Does he get others to do what he wishes?	|	|	|	|	|	|	_____
	Probably unable to lead his fellows	Lets others take lead	Sometimes leads in minor affairs	Sometimes leads in important affairs	Displays marked abili- ty to lead his fellows; makes things go		
Please record here instances that support your judgment.							

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<p>D. How does he control his emotions?</p>	<table style="margin: auto; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Too easily moved to anger or fits of depression, etc.</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Tends to be over emotional</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Usually well balanced</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Well balanced</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Unusual balance of responsiveness and control</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Unresponsive, apathetic</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Tends to be unresponsive</td> <td colspan="3"></td> </tr> </table>	Too easily moved to anger or fits of depression, etc.	Tends to be over emotional	Usually well balanced	Well balanced	Unusual balance of responsiveness and control	Unresponsive, apathetic	Tends to be unresponsive				<p style="text-align: right;">—</p>
Too easily moved to anger or fits of depression, etc.	Tends to be over emotional	Usually well balanced	Well balanced	Unusual balance of responsiveness and control								
Unresponsive, apathetic	Tends to be unresponsive											
<p>Please record here instances that support your judgment.</p>												
<p>E. Has he a program with definite purposes in terms of which he distributes his time and energy?</p>	<table style="margin: auto; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Aimless trifler</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Aims just to "get by"</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Has vaguely formed objectives</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Directs energies effectively with fairly definite program</td> <td style="border: 1px solid black; padding: 2px; font-size: 8px;">Engrossed in realizing well formulated objectives</td> </tr> </table>	Aimless trifler	Aims just to "get by"	Has vaguely formed objectives	Directs energies effectively with fairly definite program	Engrossed in realizing well formulated objectives	<p style="text-align: right;">—</p>					
Aimless trifler	Aims just to "get by"	Has vaguely formed objectives	Directs energies effectively with fairly definite program	Engrossed in realizing well formulated objectives								
<p>Please record here instances that support your judgment.</p>												

Fig. 26.—Public School Rating Form.

The suggestion that all qualities and their varying degrees be defined in objective behavior, while it is highly important, is difficult to put into effect. It is essential, in selecting behavior illustrative of the various degrees, to secure examples that will fall within the experience and observation of all raters. It is possible to reduce this difficulty for raters by allowing them to check the degree of each quality they think appropriate and then requiring that they describe some event or instance in the behavior of the individual that supports this judgment. Such a procedure requires that each rater shall think in terms of objective behavior, but it increases the problems of those who score and interpret ratings, for there is no assurance that the behavior so described would be interpreted by all raters as evidencing the same degree of the quality rated. One of the most successful and carefully prepared of rating scales, a portion of which is illustrated in Figure 26, makes use of this device.

A final limitation is the ever-present tendency for ratings to display the "halo" effect. This is by all odds the most common deficiency in ratings. The individual appears superior, inferior, or average, in a general way, and all individual qualities tend to be rated at that level. If the rater regards the ratee as a "good man," he rates him high on all counts. The effect has appeared repeatedly in extensive studies of large numbers of ratings. It featured army ratings of officers and aviators. Knight clearly showed the same tendency in teacher ratings. He found, for instance, a high correlation between ratings of voice and of intelligence, qualities that would not be expected to be associated in a greater degree than could be explained by chance. The presence of the halo effect in rating of this type is unquestionable. That effect is the most common and the most serious limitation upon the value of service ratings, and it necessitates constant, critical attention in every case where such ratings are to be used.⁹

⁹See, Bradshaw, F. F., "Revising Rating Scales," *Personnel Journal*, December, 1931, Vol. 10, pp. 232-245; "What's Wrong with Service Ratings?" *Public Personnel Studies*, February, 1929, Vol. 7, No. 2, pp. 18-28.

Moore suggests that traits selected must be definitive and mutually exclusive if ratings are to be effective. If they are overlapping, that fact tends to encourage the halo effect in which the general impression of the rater is allowed to obscure judgment of individual traits. To avoid confusion, therefore, each quality must be sharply defined.

Instructions to raters. Written instructions given to raters may exert a definitive effect upon the quality of ratings. They cannot ordinarily be extensive, else they will not be given careful attention, but they should warn the rater against the most common shortcomings and they should clearly describe the process contemplated in the rating procedure. They may stress the following general principles:

1. If the rater does not have a knowledge of the ratee, he should not rate him at all.
2. If the rater feels uncertain with respect to any quality, he should not rate on that one.
3. The general impression must not be permitted to color judgment of specific traits.
4. The relationship of the rater and ratee must always be carefully noted.

Ordinarily, rating procedure will be made much more effective if raters are given special instructions, as a group, before the rating process begins. Then written instructions need not bear such great responsibility. Rating procedure must not be hurried. Raters must be allowed ample time.

Exercises and Problems

1. Prepare a report on one of the articles to which reference is made in this chapter.
2. Develop a rating scale to be used by administrative officers in a college or university for rating faculty members.
3. Secure a rating scale now in use in industry or business and summarize your criticisms of it.
4. Evaluate the reliability of ratings secured from the two raters whose ratings on identical employees at adjacent rating periods are summarized in the following table:

Service Rating

Employee No.	Rater A		Employee No.	Rater B	
	First Rating	Second Rating		First Rating	Second Rating
	X	Y		X ₁	Y ₁
1	40	50	31	40	50
2	40	45	32	40	55
3	40	55	33	45	55
4	45	40	34	45	60
5	45	50	35	50	60
6	50	45	36	50	70
7	50	50	37	55	65
8	50	60	38	60	65
9	50	70	39	65	70
10	55	65	40	65	75
11	55	55	41	70	75
12	60	50	42	75	75
13	60	70	43	75	80
14	60	75	44	80	85
15	75	60	45	80	90
16	75	80	46	80	75
17	80	90	47	95	90
18	80	60	48	100	90
19	85	60	49	90	95
20	90	60	50	90	75

5. Estimate a second rating, for Rater A, on a ratee given a score of 70 on the first rating. What is the standard error of this estimate?

6. Estimate a second rating, for Rater B, on a ratee given a score of 70 on the first rating. What is the standard error of this estimate?

7. Ratings accorded prospective agents of the Delta Insurance Company are compared, in the attached summary, with subsequent average monthly sales in dollars. Measure and evaluate the correlation between the two series, and chart the relationship, with the standard error of estimate. Predict sales for an applicant who rates 300.

Rating	Sales	Rating	Sales	Rating	Sales	Rating	Sales	Rating	Sales
286	15	306	37	291	29	247	10	273	20
298	32	280	13	331	41	265	27	257	15
322	43	306	37	291	30	254	39	247	12
350	47	280	28	329	42	272	25	264	28
349	47	306	35	289	20	257	16	254	40
321	47	280	29	328	43	247	14	271	20
298	30	304	38	289	28	264	29	257	17
285	23	280	30	327	45	253	45	249	16
347	48	304	37	288	28	271	20	264	30
321	47	279	31	326	48	256	18	253	44
296	37	303	38	288	25	246	18	271	20
285	22	279	33	326	41	264	30	256	19
346	48	302	37	288	24	253	43	246	20
320	46	279	34	326	47	270	15	263	25
295	36	301	38	287	23	256	24	253	42
284	25	278	35	325	46	245	5	270	15
345	49	301	41	286	22	262	24	256	21
318	45	278	36	324	46	252	41	245	10
295	35	301	43	286	21	270	15	262	23
284	23	278	31	323	46	256	22	243	15
344	46	300	40	286	27	270	5	261	25
317	43	277	31	323	45	256	23	252	39
295	36	300	35	286	24	243	20	270	10

Service Rating

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Rating	Sales	Rating	Sales	Rating	Sales	Rating	Sales	Rating	Sales
283	24	277	30	276	45	261	24	256	24
343	48	267	16	259	20	251	38	242	3
316	42	253	30	249	31	269	15	261	23
294	37	276	40	267	17	254	25	251	36
283	25	259	19	253	31	242	6	269	14
342	49	249	27	276	38	261	22	254	26
314	43	267	18	259	18	250	35	241	9
294	34	253	32	249	26	269	18	260	21
282	26	276	38	267	18	254	27	250	34
341	48	259	18	253	32	241	12	268	12
312	43	249	26	275	37	260	20	254	28
294	33	267	19	258	17	250	33	240	15
282	27	253	33	249	25	268	15	260	20
340	47	275	36	267	20	254	29	250	32
312	44	258	16	253	34	239	18	238	40
293	32	248	20	275	35	221	16	199	17
281	28	267	21	258	15	237	30	220	18
337	46	253	35	248	15	199	21	237	20
310	40	275	25	266	22	219	20	198	25
293	37	258	14	254	36	236	10	219	22
281	15	248	5	274	20	197	29	235	35
335	44	266	23	258	13	218	24	195	31
309	39	254	35	248	4	234	25	218	26
292	31	274	35	266	24	194	30	234	15
281	16	267	12	254	34	217	28	193	31
333	46	248	6	273	25	234	5	216	30
307	38	265	25	257	13	191	30	233	20
291	30	254	37	247	8	215	32	190	20
280	14	273	35	265	26	233	25	214	34
332	40	257	14	254	38	189	18	231	21

Collateral Reading

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CHAPTER XIII

Remuneration: Wage Plans

MANY of the most difficult problems of modern industrial relations arise out of and involve considerations of wages. That fact is clearly evidenced in the data of industrial disputes, which show wages as the most common of all causes of such disputes in the period from 1919 to date.

Wages are not, however, of importance in industrial relations merely because they are the subject of numerous disputes. They are important, also, because both wage earner and management regard them as one of the definitive conditions of the coöperation of employers and employees. To the wage earner, wages are, of course, the principal source of his livelihood. To the employer, on the other hand, wages are the largest single cost of production. For industry as a whole, wages represent some 60 per cent of all such costs, and in some industries, this proportion is much higher. In manufacturing, for instance, wages were calculated in 1925 as 87.8 per cent of total costs; in mining they amounted to 71.8 per cent; in construction, 73.4 per cent; and in transportation, 75.6 per cent. Looked at from the standpoint of the distribution of the national income—a good point from which to obtain an over-all perspective—wages and salaries, together with other such income as bonuses and services in the form of group insurance, accounted for 65.5 per cent of the national income in 1929 and had increased to 66.5 per cent of that total in 1936.

Standard Statistics has reported recently on labor costs within manufacturing. Where such costs are expressed as percentages of F.O.B. factory prices, it appears that they represent 3.7 per cent on such prices in sugar refining, 5.4

per cent in cigars and cigarettes, 5.8 per cent in meat packing, 7.7 per cent in paints, 7.8 per cent in fertilizer manufacturing, 8.4 per cent in foods, 9.1 per cent in automobiles, 10.1 per cent in chemicals, 15.5 per cent in paper, 17.4 per cent in cement, 17.5 per cent in rubber tires, 19.1 per cent in printing, 20.1 per cent in bakeries, 20.6 per cent in iron and steel, 21.3 per cent in radio, 22.6 per cent in textiles, 23.9 per cent in machinery, 26.6 per cent in shoes, 32.8 per cent in aircraft, and 35.8 per cent in shipbuilding. These are, it should be understood, percentages representing direct labor costs. They do not represent the accumulated labor costs involved in materials purchased for processing.¹

Amounts of individual wages vary greatly from occupation to occupation, but it may be worth while to note briefly certain facts with respect to current annual wages. In 1929, the average wage of all employees was \$1,450. Salaried employees in the industries for which data were available averaged \$2,560, and wage earners averaged \$1,395. At the depth of the depression in 1933 the average for all employees was \$1,082, that for salaried workers was \$2,043, and that of wage earners was \$902. In 1936, the average for all employees was \$1,244, that for salaried workers was \$2,333, and that of wage earners was \$1,142.²

The discussion of wages and their relationship to personnel administration is divided, in subsequent paragraphs, into two major parts. The first is concerned with types and methods of remuneration and directs attention to the various current methods of adjusting wages to production and to other considerations for which payment is made. The second major division, which forms the subject matter of the chapter following, includes a consideration of the most important factors to be taken into account in formulating or evaluating wage policies.

Types of wage payment. Numerous studies have disclosed four major types of wage payments in current use in

¹ *Survey of Labor Law Administration*, August, 1937, pp. 17-18.

² *Survey of Current Business*, June, 1937, Vol. 17, No. 6, pp. 11-17.

this country. They include: (1) time wages, that is, those paid per hour, per day, or per week; (2) individual piece rates, paid on a straight unit basis; (3) group piece rates, where the unit basis of payment is extended to include a group of workers rather than individuals; and (4) premium or bonus plans, in which extra production is rewarded by some more complicated compensation than that provided by the simple piece-rate arrangement.

The studies mentioned³ indicate the relative dependence placed by American industry on these various types of wage payment. The most recent discloses that, in 1935, 56.3 per cent of the employees of industry as a whole were employed on time rates, while 16.4 per cent were paid on a piece-rate basis. Another 5.7 per cent of all employees were working under conditions of group piece or tonnage rates, while 21.6 per cent were operating under premium or bonus plans. The industry that placed greatest reliance on time wages was automobiles, where 83.4 per cent of all employees were so compensated. In clothing, 80.4 per cent of the workers were compensated by individual piece rates, while the electrical manufacturing industry was outstanding in its use of group piece rates, and printing and publishing led in the use of premiums and bonus plans. A comparison of such studies over a period of years seems to show an increasing dependence upon time rates and premium or bonus plans and a definite reduction in numbers operating on a piece-rate basis.

Time wages. Time rates are not only the most common type of wages, they are also the best established from the standpoint of age and tradition. Many conditions explain their predominance. They are about the only type of payment that can be used where the output of individual workers is difficult or impossible to measure, where no simple account of personal production is possible. Also, they are

³ See, for instance, *Systems of Wage Payment*, 1930, and *Financial Incentives*, 1935, New York, National Industrial Conference Board; Person, H. S., *Encyclopaedia of the Social Sciences*, 1935 edition, Vol. VIII, pp. 677-681.

satisfactory in cases where stimulation of individual workers is unnecessary, where speed of work is otherwise motivated, as is the case, for instance, on line production, where workers must keep pace with the production line. In many cases, they are and have long been the traditional method of compensation, and union regulations frequently specify their use. Unions rather generally prefer or insist upon time wages as a necessary standardization of conditions in collective bargaining. They contend that it is difficult to bargain collectively if wages are to be allowed to vary greatly according to individual output.

Where conditions of employment make delays and interruptions in the work inevitable, time wages are generally preferred, on the ground that it is unfair to ask workers to accept resultant interference with their earnings on any sort of piece-rate basis. Again, where it is desired to emphasize quality rather than quantity of output, time wages are likely to be used. Many firms that have large portions of their employees on a piece-rate basis place beginning employees on a time basis, on the theory that new workers cannot be expected to earn what they should under the other arrangement.*

The use of time wages has disadvantages as well as advantages. Some of the latter have been suggested in noting reasons why such wage arrangements are used. One of these disadvantages is the fact that time wages, in themselves, offer no incentive for superior performance. When they are used, it may frequently be necessary to stimulate performance by other means. Because time wages offer no special incentive, they increase the responsibility imposed upon foremen and minor executives who must, in order to get the work out, see to it that employees are encouraged to do their best. Furthermore, the stimulation of performance among employees who are working on an hourly or daily basis is frequently difficult, for employees are likely to become ardent adherents of what is sometimes described as the "lump of labor" theory. When they observe the fact

that there is no direct and immediate relationship between their volume of production and their wages, they frequently conclude that there is no relationship at all, that management will continue to employ them at the going rate quite irrespective of their production or, in other words, quite irrespective of unit labor costs. This conception, encountered among many types of workers in modern industry, leads to all kinds of erroneous conclusions. It is held to justify slowing down production in order to make work last as long as possible. It justifies a variety of claims for increased wage rates on the ground that they are quite unrelated to the actual value of production to management, that employers will pay almost any price for labor, since what they want is a fixed quantity of it. It holds, in brief, that there is a fixed "lump" of work to be done and that it has to be done, regardless of the rate of pay of workers or resulting unit labor costs.⁴

Another disadvantage of time wages is the increased difficulty of planning labor costs. When time wages are paid, unless the rate of production is determined by the speed of the production line or by some other similar means, management may be uncertain as to unit labor costs.

Finally, time wages do not allow individual workers to earn as much as they might under other systems. All workers are necessarily reduced to something approximating their average value, so that exceptional workers are thus penalized.⁵

Piece rates. The piece-rate wage, in its simplest form, represents a payment of so much per unit processed. Sometimes the piece rate is modified by the guarantee of a minimum hourly wage, in which case it is usually referred to as a guaranteed piece rate. In others, there is no such simple

⁴ See, Kruger, Wm. C., "The Influence of Amount Limits and Time Limits upon the Rate of Work," *Journal of Applied Psychology*, February, 1937, Vol. 21, No. 1, pp. 113-118.

⁵ See, as illustrating ordinary time wages, "Hourly Entrance Wages of Common Labor," *Monthly Labor Review*, December, 1934, Vol. 39, No. 6, pp. 1454-1457.

arrangement, but provision is made for a number of different rates for different levels of performance. When piece rates are so complicated, they are generally described as incentive wages. The ordinary piece rate is sometimes called the simplest form of the incentive wage.

There are a number of features that generally characterize the types of work in which piece rates are used. Obviously, for instance, such payments are applicable only when the amount of work done by the individual employee is readily ascertainable, which means that units of production must be sharply defined and amenable to measurement by counting, weighing, or otherwise. Piece rates are particularly useful in occupations where soldiering or loitering is difficult to detect and control, since they penalize the worker for his indolence. They require, however, fairly uniform and dependable conditions of work, since a lack of uniformity in such conditions places unreasonable burdens on the worker, and the same consideration requires that raw materials upon which he works shall come to him in unvarying form and without delays beyond his control. For this reason, it is desirable that production processes in which the piece rate is used shall be quite independent of others that might interfere with or retard them. For similar reasons, it is desirable, if individual piece rates are to be used, that there be no division of labor within the process for which such rates are paid, so that individual workers do not slow up their fellows. The piece-rate system is particularly valuable with certain types of workers who desire the independence and personal autonomy that such a method of wage payment permits. Coal miners, for instance, have generally expressed a distinct preference for it, since it leaves control over the speed of their operations almost entirely in their own hands. Piece rates are convenient, from management's standpoint, in that they simplify the measurement of labor costs and permit ready forecasting of such costs.

Limitations upon the satisfactory use of piece rates are numerous. They cannot be satisfactorily used where work

is intermittent or where delays beyond the control of individual employees are frequent. If quality is an important factor, they increase the necessity for supervision and detailed inspection and may thereby appreciably increase labor costs. They are a much more frequent source of friction between workers and management than are time rates, probably because, when individual workers become especially proficient and increase their earnings beyond the level which management regards as approximately proper, there is a strong tendency to adjust piece rates downward in order to bring earnings into line with those of workers employed in other departments on an hourly basis. Many workers constantly fear these adjustments or the closely related speed-up, in which they are forced to increase output to maintain earnings, and their fear seriously impairs morale throughout the organization. Piece rates cannot generally be used in new operations, where proper production levels have not been carefully ascertained. They may be misleading with respect to their relationship to overhead costs, for they frequently increase such costs, in part by requiring much more detailed supervision and inspection. Insofar as they allow workers to determine upper limits of production, they may encourage a disregard for essential health considerations, for, as Adam Smith observed, "Workmen, when they are liberally paid by the piece, are very apt to over-work themselves, and to ruin their health and constitution in a few years."

Many unions are definitely opposed to the use of piece rates, both because of their belief that such rates inevitably lead to the "speed-up" and because earnings of individuals vary so greatly as to cause dissatisfaction among their members, at the same time that they prevent the "standardization" of employees long regarded by unions as an essential feature of collective bargaining.

The satisfactory use of piece rates requires the most careful study as a basis for the original determination of such rates and continued study as a basis for their readjustment. Because there are no principles that can be stated for deter-

mining fair levels of piece rates, and because they have frequently been instituted without careful study, they have often tended to drive employees at a furious pace and thus to create ill-feeling among workers. Many students of industrial relations have, for this reason, severely criticized piece rates, and some industrial consultants have gone so far as to declare that there is no place in industry for them, that they are bound to disappear as management becomes increasingly aware of their limitations.

Group piece rates. In many types of industrial operations, production cannot be so divided and specialized as to secure anything approximating independence among operations, so that individual piece rates are impracticable. Sometimes, in such cases, small groups of workers, making up a production unit, are placed on a group piece-rate basis. They are encouraged to operate as a unit and are paid so much per unit of production, with such payments divided equally or according to some pre-arranged schedule among them.

Such an arrangement is subject to most of the limitations noted in the discussion of individual piece rates. It has the added difficulty of providing for the introduction of new or substitute employees who may not be able to hold up their portion of the group's task and may, therefore, penalize the whole group. Even where no new employee is involved, friction is likely to appear as fellow employees seek to spur their colleagues beyond levels of performance which the latter regard as proper. On the other hand, the plan frequently meets a real need and proves quite satisfactory, and there are some operations in which it is especially effective.

Incentive wage systems. One of the earliest contributions of so-called scientific management consisted of special methods of wage payment representing more complicated and elaborate adaptations of the piece-rate principle and generally described as incentive wage systems. An almost endless variety of such plans, as far as detailed arrangements are concerned, has appeared since the early eighties of the

last century. All of them seek to provide added incentives for superior performance, incentives beyond those provided by the ordinary piece rate. It is for that reason that they are described as incentive wages. Each seeks to attain this result by providing extra compensation for production in excess of ordinary levels. All are more or less alike in this feature, for provision is made for a "base rate," generally although not universally regarded as the amount that would be paid to an average workman, under average conditions of experience and skill. Sometimes, this base rate is referred to as a "starting wage." All are similar in that employees are paid for production beyond this level at a premium rate or at a series of such rates, which may increase or decrease as production reaches higher levels.⁹

As a matter of fact, all the many plans are similar in a number of features and vary only in details, of which the name of their designer, generally attached to them, frequently appears as about the only essential difference. It appears, in other words, that a large number of industrial councilors and engineers, in the early days of modern personnel and industrial management, conceived the idea that each should have an incentive wage system of his own. Each proceeded, therefore to incorporate some change, generally a minor one, in the arrangement he regarded as most generally applicable.

A variety of names and terms thus became associated with these plans. They were sometimes described as *premium plans*, so called because they provided a premium for outstanding performance and for making especially productive use of capital and equipment. Typical of this group are the Halsey, Barth, Rowan, and 100 Per Cent premium plans. Other originators described their contributions as *bonus plans* for the same reason. Best known are the Die-

⁹See Jansen, R. E., "Incentives Cut Handling Costs 9% to 50%," *Manufacturing Industries*, October, 1928, Vol. 16, No. 6, pp. 415-418, and November, 1928, Vol. 16, No. 7, pp. 525-528; Vernon, H. M., "The Effects of a Bonus on the Output of Men Engaged in Heavy Work," *Journal of Industrial Psychology*, January, 1929, Vol. 4, No. 1, pp. 267-270.

mer and Baum bonus plans and the Gantt task and bonus plan. More specifically titled are the Taylor and Merrick *differential piece rate plans*, so called because they increase piece rates as individual production grows, differentiating in the unit payments to inferior and superior workers. Still other plans have specialized features by which they are known, or combine the features of the groups just mentioned, as is the case with the Emerson, Ficker, Standard-Hour, Haynes-Manit, and Bedeaux Point Premium plans.

Numerous classifications of incentive wage systems have been attempted, but none is entirely successful. They have sometimes been divided into two groups, one requiring standardized production conditions, the other adaptable to unstandardized conditions. They have been classified as group plans and individual plans. Another classification has sought to distinguish their emphasis upon time consumed or saved or upon pieces produced. In the discussion which follows, four general groups of plans are considered, although the grouping provides no simple basis of classification. Rather, plans are distinguished as: (1) those which emphasize a selective effect upon workers; (2) those which emphasize time saving; (3) those which attempt to combine these objectives, and (4) special group incentive plans.

The purpose of the descriptions in succeeding paragraphs should be clearly understood. It would appear that the student should obtain: (1) an understanding of the general principles operative in all incentive wage plans; (2) a series of illustrations showing how such systems work, how they attain the objectives they seek; (3) a suggestion as to where detailed analysis of the more important of such plans may be found, and (4) a recognition of the essential conditions to be taken into account in selecting plans for specific occupations or in evaluating those now in use. Subsequent paragraphs attempt to provide this information.

Selective plans. All incentive wage plans exert some kind or degree of selection upon workers. By paying those who are proficient at higher rates than are provided for in-

efficient employees, a selective tendency—in which workers who can perform at high levels are attracted and those who cannot are encouraged to quit—is inevitable. Certain of the incentive wages, however, intentionally emphasize this feature. Such is the case, for instance, with the Taylor Differential Piece Rate, the Merrick Multiple Piece Rate, the Emerson Efficiency plan, the Knoepple Efficiency plan, and the Bigelow Bonus plan. Oldest and best known of these is the Taylor Differential Piece Rate, and, although it is seldom used in its original form today, the principle operative in it is the basis for numerous, widely used modifications. The usual provisions of the plan may be summarized as follows: two piece rates are provided, one for superior performance at a rate to permit earnings considerably above what are generally regarded as normal or usual compensation for the occupation, and the other at an appreciably lower level, so that those who receive it will not earn an amount generally regarded as appropriate compensation for such work. Workers become eligible for the high rate only when they have reached a standard somewhat above normal or usual performance on the job. The operation and effect of this type of payment may be seen in Example 14. Employee D in the example can turn out only 90

EXAMPLE 14

THE TAYLOR DIFFERENTIAL PIECE RATE

Data: Normal weekly wage, \$20 (40 hours); standard output, 4 units per week, 10 hours per unit; piece rates, standard and above, \$5 per piece, under standard, \$3.75 per piece.

Employee	Units per Week	Piece Rate	Weekly Earnings
A	8.0	\$5.00	\$40.00
B	6.0	5.00	30.00
C	4.0	5.00	20.00
D	3.6	3.75	13.50

per cent of what is regarded as standard performance. Employee C makes standard but no more. Employee B pro-

duces one and one half times standard production, and Employee A produces twice the standard output. Their weekly earnings are compared as shown in the example.

It will be apparent that superior workers will be encouraged to accept and maintain their employment, while inferior performers will be discouraged and are likely to leave. That is one of the major objectives of the arrangement.

Greatest difficulty in establishing and maintaining an incentive wage system of this type is the determination of the level of performance that is to be regarded as standard. Also, satisfactory selection by the differential piece rate requires careful attention to all the conditions affecting the worker's performance. Taylor, of course, assumed that the system would be used only after conditions of production were carefully standardized and production standards were established by detailed timing of each step in the performance of the job, and he held that it achieved its greatest value only if and when employees were provided with such equipment as would make for most efficient performance.⁷

Time saving plans. Another group of incentive wage systems bases its compensation primarily upon the measure of time saved and compensates the worker directly for such savings. There are many such plans, but the best known is probably the Halsey Premium plan. The plan involves both an hourly rate and a premium piece rate, a fact that simplifies its introduction. It provides that the worker who produces at or below what is regarded as standard output shall receive a minimum weekly wage, and that superior workers shall be compensated for time saved at from 30 to 50 per cent of the time wage rate. The general plan of operation may be seen from Example 15, where the four workers are the same, as far as the productivity of each is concerned, as those who were described in connection with the Taylor Differential Piece Rate plan in Example 14.

⁷See, Rich, A. B., "Time Study and Wage Systems," *Bulletin of The Taylor Society*, April, 1933, Vol. 17, No. 3, pp. 53-57.

EXAMPLE 15

THE HALSEY PLAN

Data: Normal weekly wage, \$20 (40 hours); normal hourly rate, 50 cents; normal output or production, 4 units per week, 10 hours per unit; earnings, time taken at hourly rate plus premium, guaranteed weekly wage, \$20; premium, 50 per cent of time rate for time saved.

Em- ployee	Units per Week	Time Taken per Piece, Hours	Time Saved per Piece, Hours	% Normal Time Taken per Piece	% Nor- mal Time Saved per Piece	Labor Cost per Piece			Weekly Earn- ings
						Wage	Prem- ium	Total	
A	8.0	5.000	5.000	50.00	50.00	\$2.50	1.25	3.75	\$30.00
B	6.0	6.667	3.333	66.67	33.33	3.33	.84	4.17	25.00
C	4.0	10.000	.....	100.00	.....	5.00	.....	5.00	20.00
D	3.6	11.111	.....	111.11	.....	5.56	.....	5.56	20.00

The system, as originally introduced, does not require standardized conditions, and normal performance is determined by previous experience in the plant. It is a notable characteristic of the plan that while it provides for higher earnings for superior workers, it does not increase but rather decreases the piece rate as performance improves. Superior workers receive less for each addition to their productive efficiency.

The Rowan system, frequently referred to in discussions of incentive plans, is, in effect, only a variation of the Halsey plan. Its distinctive feature is the fact that the premium for time saved is not a flat rate, from 30 to 50 per cent under the Halsey plan, but a variable proportion defined as the percentage of time saved. Employee B, for instance, who saves 33 per cent of his time, being 150 per cent efficient, has a premium rate of 33 per cent. Employee A, who is 200 per cent efficient, saves 50 per cent of his time and his premium rate is 50 per cent. However, the premium rate applies not to time saved but to the payment for time taken so that the premium rate increases with increased efficiency while the base to which it applies is reduced at the same

time. The manner in which this effect is accomplished is shown in Example 16.

EXAMPLE 16

THE ROWAN PLAN

Data: Normal weekly wage, \$20 (40 hours); normal hourly wage, 50 cents; normal output or production, 4 units per week, 10 hours per unit; earnings, time taken at hourly rate plus premium, guaranteed weekly wage, \$20; premium, rate is percentage of time saved, base is time taken.

Em- ployee	Units per Week	Time Taken per Piece, Hours	Time Saved per Piece, Hours	% Normal Time Taken per Piece	% Nor- mal Time Saved per Piece	Labor Cost per Piece			Weekly Earn- ings
						Wage	Pre- mium	Total	
A	8.0	5.000	5.000	50.00	50.00	\$2.50	1.25	3.75	\$30.00
B	6.0	6.667	3.333	66.67	33.33	3.33	1.11	4.44	26.67
C	4.0	10.000	.....	100.00	.....	5.00	.....	5.00	20.00
D	3.6	11.111	.....	111.11	.....	5.56	.....	5.56	20.00

While the two systems have much in common, it will be apparent from the table that there are distinctive differences. The Rowan plan provides greater returns to workers only slightly above standard than does the Halsey plan, but the latter provides greater rewards for exceptionally high performance (above 200 per cent efficiency). As a result, labor costs per unit for unusually efficient workers are considerably greater under the Halsey plan than under the Rowan plan. The studies of the National Industrial Conference Board lead to the conclusion, however, that both average earnings and average labor costs are slightly less under the Halsey plan than under the Rowan system.

Both of the plans just considered, while they compensate workers for saving time, do not allow the employee full payment for time saved. An interesting variation of these systems is provided by the so-called 100 Per Cent Premium plan, which compensates employees at the regular rate for all time saved. In effect, the plan provides straight piece

rate payments for all production above standard. The plan is intended for operation under fully standardized conditions, and the worker has a guaranteed hourly wage. The operation of the plan is illustrated in Example 17.

EXAMPLE 17

THE ONE HUNDRED PER CENT PREMIUM PLAN

Data: Normal weekly wage, \$20 (40 hours); standard output or production, 4 units per week, 10 hours per unit; standard hourly rate, 50 cents; earnings, time taken at standard hourly rate plus premium, guaranteed weekly wage, \$20; premium, payment for time saved at full hourly rate.

Employee	Units per Week	Time Taken per Piece, Hours	Time Saved per Piece, Hours	Wage for Time Taken per Piece	Premium for Time Saved per Piece	Labor Cost per Piece	Weekly Earnings
A	8.0	5.000	5.000	\$2.5000	\$2.5000	\$5.00	\$40.00
B	6.0	6.667	3.333	3.3335	1.6665	5.00	30.00
C	4.0	10.000	.....	5.0000	.....	5.00	20.00
D	3.6	11.111	.....	5.5555	.....	5.56	20.00

The plan, because of its guaranteed hourly or weekly wage, which may operate to set unit labor costs at a high level for inferior workers, is generally associated with a fairly high standard output. Since the straight price rate payment, which appeals strongly to superior workers, does not become available until performance equals or exceeds standard, the choice of standard is highly significant. In spite of the 100 per cent premium, if the standard set is high, the worker may not make as much under the plan as under the Halsey or Rowan plans where lower standards prevail. In the 100 Per Cent plan, timing is generally quite strict, and production in excess of standard is distinctly unusual.

A variation of the 100 Per Cent Premium plan, intended to avoid the arbitrarily high standard of that plan, is presented in what is called the *standard hour* plan. Its virtue lies chiefly in its flexibility, and this distinction alone differentiates it from the 100 Per Cent Premium plan. Standard may be set at varying levels of efficiency for different

operations. A guaranteed hourly or weekly rate is provided, and savings of time above standard are compensated for in full. The plan assumes careful job analysis, including timing. The measure of performance is the standard hour's work, from which the plan gets its name. Operatives are given credit for the number of standard hours that their output represents. If the plan were applied to employees as in previous examples illustrating other systems, with the piece rate applicable at 3.6 units (the level of Employee D), the wages and labor costs involved would appear as shown in Example 18.

EXAMPLE 18

THE STANDARD HOUR PLAN

Data: Guaranteed weekly wage, \$18; standard output or production, 4 units per week, 10 hours per unit; standard hour's work, 4 unit; standard hour rate, 50 cents; earnings, for 90 per cent standard and above, full payment for standard hours allowed, below 90 per cent, guaranteed weekly wage.

Employee	Units per Week	% Standard Efficiency	Standard Hours Allowed	Weekly Earnings	Labor Cost per Piece
A	8.0	200	80	\$40.00	\$5.00
B	6.0	150	60	30.00	5.00
C	4.0	100	40	20.00	5.00
D	3.6	90	36	18.00	5.00
E	3.0	75	30	18.00	6.00

Other plans, similar to those described here, include the Barth Premium plan, the Ficker Machine Rate plan, and the Priestman system.

Combination plans. The first group of incentive wage plans considered in preceding paragraphs places major emphasis upon a selective effect exerted upon employees, while the second emphasizes payment for time saving. A number of additional plans have been designed to combine these objectives. Such, for instance, is the so-called Gantt Task and Bonus system, which is probably the best known of these plans. The Gantt system provides the higher piece rate for superior performance typical of the Halsey and

Rowan plans, but it also sets a standard somewhat above normal production, so that inferior workers are sharply distinguished in earnings from superior performers. The system is predicated upon careful time study under standardized conditions, and standard is set at a level which is attainable only by persistent use of the most effective methods. The plan, as advocated by its author, provides a bonus for foremen, such a payment to be adjusted according to the number of employees under the foreman's supervision who are able to make the level of standard performance, and this feature has been incorporated in many other plans.⁸

The method of calculating wages involves, first of all, the

EXAMPLE 19

THE GANTT TASK AND BONUS SYSTEM

Data: Guaranteed weekly wage, \$17.50; standard output or production, 6 units per week, 6.667 hours per unit; standard time rate, 50 cents per hour; earnings, standard and above, time allowed at standard time rate plus premium, below standard, guaranteed weekly wage; premium, 20 per cent of payment for time allowed.

Employee	Units per Week	Standard Hours Allowed	Wage for Time Allowed	Premium	Weekly Earnings	Labor Cost per Piece
A	8.0	53.333	\$26.67	\$5.33	\$32.00	\$4.00
B	6.0	40.000	20.00	4.00	24.00	4.00
C	4.0	26.666	...	...	17.50	4.38
D	3.6	24.000	...	...	17.50	4.86
E	3.0	20.000	...	...	17.50	5.83

distinction of workers who make standard and those who do not. For the latter, straight time wages prevail. For superior workers, payment includes full compensation at piece rates plus a 20 per cent premium on such piece rates. As a

⁸ See, Jordan, J. P., "Principles of Incentives for Executives and Key Men," New York, American Management Association, General Management Series, No. 113, 1930, and "Incentive Remuneration," *Annalist*, October 19, 1928, Vol. 32, p. 605; "Extra Financial Incentives for Supervisors and Indirect Labor," New York, American Management Association, Production Executives' Series, No. 64, 1928; Bethge, C. A., "Incentives for Office Workers," New York, American Management Association, Office Executives' Series, No. 42, 1929.

result of the premium there is a definite break in wages at standard, and workers below that level work at a weekly wage. If, however, workers fall far below standard, labor costs per unit advance rapidly, for which reason such workers are not likely to be held on the job. The operation is illustrated in Example 19. Other plans embodying essentially the same principles include the Baum Differential Gain Sharing plan and the Diemer Bonus and Premium plan.

Group plans. A number of incentive wage plans have been designed for situations in which division of labor cannot be carried to the point where the work of individual employees can be separated from that of their fellows. The Priestman plan, mentioned as one of those which emphasizes time saving as a basis for compensation, has sometimes been adapted to these conditions, and there are a number of group bonus and group piece-rate arrangements in current use. In many cases they are preferred over individual incentives, because they tend to develop a spirit of coöperation and unity among employees. At the same time, it is necessary to recognize the fact that such arrangements make the introduction of new workers difficult and tend to encourage the organization of cliques among employees.

Several of the incentive systems described in preceding pages have been adapted for group application. While no specific plan can be regarded as typical, usual arrangements provide for the definition of a standard of performance for the group and the payment of a specified bonus for production in excess of that level. Generally, such a bonus is distributed among group members in proportion to the hours each has worked or according to the flat rate earnings of such workers. It is customary, in most of these plans, to provide a guaranteed hourly wage.⁹

⁹ *Systems of Wage Payments*, pp. 119-120, New York, National Industrial Conference Board, 1930; Whisler, R. F., "Uses and Limitations of Group Incentives," *Factory and Industrial Management*, July, 1929, Vol. 78, No. 1, pp. 43-46; Balderston, C. C., *Group Incentives: Some Variations in the Use of Group Bonus and Gang Piece Work*, Philadelphia, University of Pennsylvania, 1930.

Inter-departmental plans. One of the most important complications arising out of almost all early incentive wage systems was the fact that, in many plants, employees could not be continuously employed at given tasks but must be shifted about from one operation to another. Under such conditions, the calculation of weekly earnings was necessarily complicated, and frequent misunderstandings resulted. Moreover, there was dissatisfaction with the selection of those who were so shifted, for men frequently preferred to continue at operations for which incentives were provided, and they objected to shifts which forced upon them a flat hourly rate.

A number of plans have been developed in efforts to overcome this difficulty and, at the same time, to equalize tasks and earnings throughout the organization. The two best known of such adaptations are the Bedeaux Point system and the Haynes-Manit system.

The Bedeaux system is predicated upon a careful time study of all operations. Upon the basis of such a study, all types of operations are evaluated in terms of the number of *B*'s they involve, a *B* being defined as one minute "composed of relative proportions of work and rest as indicated by the requirements of the whole job." Each job is rated according to the number of *B*'s it represents. Thus a job which requires 40 minutes of work and twenty minutes of rest would have a *B* of $\frac{2}{3}$ work and $\frac{1}{3}$ rest. Another job might have a *B* of 50 per cent work and 50 per cent rest. Whatever the nature of the *B* in each case, each operation is assigned a standard number of *B*'s as its task value, from which it is comparatively simple to calculate the relative efficiency of individual workers and the proportions of time saved by each. An employee who completes a job rated at 40 *B*'s in 20 minutes would, for instance, be 200 per cent efficient and would save half the time allotted. If he had completed it in 26.7 minutes, he would have saved $\frac{1}{3}$ the time and would have an efficiency rating of 150. The standards, it will be noted, are units of time.

The plan provides for a premium on time saved amounting to 75 per cent, together with a distribution of the remaining 25 per cent to supervisory and indirect services, which are assumed to have contributed to the saving. In practice, it is found that most firms appear to find the 75 per cent direct premium satisfactory but many do not distribute the additional 25 per cent.

The Haynes-Manit system is a somewhat similar procedure. Tasks are assigned given values in terms of *manits* as a result of careful time study. The *manit* is defined as "four-fifths of the amount of work that a normal worker can turn out in a minute of time without over-exertion." Since all tasks are assessed at their value in *manits*, workers may be readily shifted about, for all that is necessary, as a measure of their efficiency, is a total of *manits* produced. The plan provides a bonus for supervisory and indirect labor, and places the mass of employees on what is, in effect, a piece rate, somewhat similar to the 100 Per Cent Premium plan. Sometimes, there is a guaranteed hourly rate, and there is no reason why premiums may not be provided, in addition to the piece rate, if such an arrangement appears desirable.

Bases for choice. Emphasis upon the details of specific plans in preceding paragraphs should not lead to the conclusion that there is one perfect plan ready and waiting for each type of work or each plant. Rather, these plans have been described in order to illustrate the most common principles operative in all such plans. In any given situation, it may be desirable to use a modification of one of them, or a combination of several. The choice of an incentive wage system to be used in any particular plant or department depends upon a variety of conditions. The most important of these considerations to be taken into account may be outlined in the form of questions as follows:

1. Are conditions standardized or unstandardized? Some systems are adapted to both types of situation. Many can be successful only where conditions are fully standardized.

2. Is emphasis to be placed on selection, eliminating sub-standard performers?

3. Must the day rate be guaranteed? In some cases, public opinion, or a sense of proper managerial responsibility, or union regulations and agreements may make such a guarantee essential.

4. Must provision be made for large numbers of new employees? If so, then it is desirable to include a provision guaranteeing the day rate, and new workers may well be exempted from the incentive system during their introductory period.

5. How complicated a system can be understood by the workers involved? This consideration is highly important. In many instances, incentive plans have failed, not because they were wrong in principle, but because workers did not understand them and opposed them. If the system cannot be understood, there is the constant threat of disagreements and misunderstandings as to earnings. Employees object strenuously to being underpaid or exploited, even though the amount is small, as a matter of principle. No system should be used which is so complicated that workers cannot verify the accuracy of their earnings.¹⁰

6. Is an individual or a group plan to be used? The importance of this question and the basis for its answer have been described in preceding paragraphs.

7. Are foremen and indirect workers to receive benefits under the plan? Many conflicting reports confuse conclusions as to the desirability of such arrangements. That they stimulate production is generally agreed. But there is a tendency for workers to feel that they and they alone make the savings and that they alone should share them. Much depends upon existing relationships between employees and the supervisory force.

8. Is the clerical staff adequate to keep account of varied

¹⁰ See, Uhrbrock, Richard S., "A Psychologist Looks at Wage-Incentive Methods," *Institute of Management*, Series 15, New York, American Management Association, 1935.

earnings and to calculate savings, premiums, and bonuses? Almost all the incentive systems will require additional clerical activity, some much more than others.

9. Must workers be shifted about at different tasks? If so, some such arrangement as is provided by the Bedeaux or Haynes systems may be desirable.¹¹

Profit sharing plans. In the period prior to the recent depression, a considerable number of American firms tried systems of profit sharing. The practice originated abroad, and it has apparently been considerably more satisfactory there than in this country. In most cases, only selected groups of workers, mainly clerical and executive, have been included in the plans, and probably not more than 150 of them have been established in this country. Recent studies indicate that at least half the plans instituted in England have been discontinued, and the mortality in this country appears to have been greater.

While the simple theory of such plans is attractive, proposing to provide an additional incentive for superior performance, in practice there appear to be almost insuperable difficulties. The definition of profits is in itself subject to several interpretations. The question of loss sharing is in-

¹¹ For details and illustrations of the use of various systems of incentive wages, see, Esterline, J. W., "Esterline Angus Co. Plan," *Factory Management and Maintenance*, January, 1936, p. 21ff; Langer, Adolph, "Incentives, Plain and Fancy," *Factory and Industrial Management*, September, 1930, p. 627ff., and "Is Now the Time to Restore Incentive Plans?" *Factory Management*, May, 1934, Vol. 92, No. 5, pp. 209-210; Jucius, Michael J., "Wage Incentives in Industry with Particular Reference to the Chicago Area," *Journal of Business* (University of Chicago), January, 1932, Vol. 5, No. 1, pp. 76-85; Lowry, Stewart M., "Wage Incentives for the Smaller Industries," *Factory and Industrial Management*, September, 1932, Vol. 83, No. 9, pp. 342-344; Dooley, C. R., "What are the Trends in Wage Incentives?" *Personnel*, May, 1935, Vol. 11, No. 4, pp. 120-122; *Financial Incentives*, New York, National Industrial Conference Board (Studies, No. 217), 1935; "Methods of Wage Payment," Chicago, National Metal Trades Association, 1928; Lytle, Charles Walter, *Wage Incentive Methods*, New York, Ronald Press Company, 1929; Hosford, W. F., "Wage Incentive Applications in the Western Electric Company," *National Association of Cost Accountants Bulletin*, July 1, 1931, No. 12, pp. 1759-1774; Freeman, I. H., *Wage Incentives in the Factory*, New York, National Association of Cost Accountants, Official Publications, 1930, Vol. XI, pp. 1053-1064.

herent in profit sharing, but workers cannot be expected to accept any obligations in that direction. While bonuses from profits may be welcome when such bonuses are possible, they come to be accepted as a regular part of compensation, and their absence in periods of depression provides a further blow to employee morale. In general, such arrangements must be regarded as highly questionable from the standpoint of satisfactory and productive relationships between management and employees.¹²

Employee stock ownership. In England, profit sharing was the initial step in a process which emerged as employee stock ownership. Profits, first distributed in cash, were later divided among employees in the form of stock, and the development was described as *copartnership*. In this country, the idea of copartnership was rapidly expanded to include what the English refer to as *contributory copartnership*, that is, the sale of stock to employees, and while profit sharing did not receive any enthusiastic reception here, employee stock ownership had a much more favorable reception.¹³

Many Americans saw in employee ownership a non-revolutionary means of providing for industrial democracy. Employees would come to own the tools of production, not by seizing them, but by purchasing the business. Many managements that did not anticipate any such extensive transfer felt, nevertheless, that employee stock ownership could provide the essential community of interest for workers and owners that is the natural goal of all intelligent management.

The first plans are said to have appeared as early as 1829 in Great Britain and 1842 in France. Such arrangements became common in England during the last half of the nine-

¹² See, "Bonus and Profit Sharing Plans for Sales Executives," Chicago, Dartnell Corporation, 1931; Keir, J. S., and Hayes, E. P., "A Method of Determining Who Shall Participate Under a Managerial Profit Sharing Plan," American Management Association, *Proceedings of the Institute of Management*, Vol. 10, 1929; "Employee Profit Sharing," *Industrial Relations*, March 21, 1931, Vol. 2, No. 3, pp. 124-128.

¹³ See, Gregg, Frances, "The Resistance of Employees to Copartnership Schemes," *Human Factor*, June, 1932, Vol. 6, No. 6, pp. 222-227.

teenth century, but the idea was not extensively developed in the United States until the period following the World War. The earliest plans, in this country, were those of the Illinois Central Railway, begun in 1893, and of the United States Steel Corporation, instituted in 1903. By 1915, some sixty American firms had stock ownership plans. Following the war, such plans increased rapidly in number. By 1927, there were, according to a study made at that time, some 389 concerns having stock ownership plans, and approximately a million employees were credited with ownership of a billion dollars worth of stock. It is believed that there was a continuing expansion of such ownership until the stock market crash of 1929 effectively subdued employee interest in such securities.¹⁴

The depression caused much discontent among employee stockholders. Many of them had contracted for stock at predepression prices, for which they continued to pay although the value of such shares was greatly deflated. By 1935, many of the plans had been discontinued, and among those still in force there was a notable tendency to restrict sales to higher-paid or executive groups of employees. Many of the plans were "temporarily suspended," and there has not yet appeared any tendency to re-emphasize them.¹⁵

The most important features of American plans may be summarized briefly as follows:

1. Generally, limits are placed on the amounts of stock that may be purchased, such limits being scaled according to wages and salaries.

¹⁴ See, *Employee Stock Purchase Plans in the United States*, New York, National Industrial Conference Board, 1928; "Summary of Employee Stock Purchase Plans in Twenty Companies, 1925-1930," Princeton, Industrial Relations Section, Princeton University, March, 1930; Baker, Helen, "Statistical Analysis of Twenty Employee Stock Purchase Plans," Princeton, Industrial Relations Section, Princeton University, 1932.

¹⁵ See, "Employee Stock Purchase Plans and the Stock Market Crisis," New York, National Industrial Conference Board, Service Letter No. 61, July 15, 1930, pp. 1-3; "Savings and Stock Ownership Plans," *Handbook of Labor Statistics*, pp. 386-392, Washington, Bureau of Labor Statistics, 1936.

2. In many cases, only employees above certain wage levels and having a stated period of service with the company are eligible to purchase stock.

3. Ordinarily, stock is made available at a price considerably below its current market value, although in some of the most extensive plans, employees pay the market price.

4. The larger portion of all plans provide special credit arrangements whereby employees may purchase stock on a partial payment plan.

5. In a number of cases, special types of stock, issued for that purpose, are made available to employees. Sometimes such stock is non-voting.

6. It is regarded as necessary, in most instances, to make specific provisions regarding the re-sale of such stock, because it is purchasable by the employee at prices below those prevailing in the open market. Generally, it is agreed that stock must first be offered to the employing concern, or that it will not be sold so long as the worker remains in the employ of the concern issuing it. Sometimes, special stock having no outside market is issued to employees.

The sale of stock is of distinctly doubtful value, from the point of view of personnel administration. There is serious question as to whether employees should be encouraged to invest savings in the securities of a concern which is also the source of their employment. A study by the Industrial Relations Section of Princeton University found that 35 stocks fell in value from 100 per cent in 1926 to 15 per cent in July, 1932. Seventeen common stocks declined to 12.9 per cent, while 18 preferred stocks declined to 37.6 per cent of their 1926 value. The decline is even more precipitous if viewed from the values in 1929. Common stocks fell from an index of 158.9 to 12.9; preferred from 107.0 to 37.6; and the group as a whole from 116.3 to 15.0. While the purchase of stock may encourage thrift, there is a possibility that it may also encourage speculation in other securities, in which case, the reveries of employees may be highly excited and not conducive to most effective performance on the job. In some

cases, changing values of employee-owned securities have proved so interesting to workers as to distract attention from their work.

The coverage afforded by most plans has never included a large portion of all workers. Several investigations have disclosed that probably the largest proportion of employees owning stock in any plan does not exceed 40 per cent, and most plans are confined to less than 10 per cent of employees. So far as worker control or ownership is concerned, it is estimated that, in 1929, when the plans were at their peak, employees owned about 1 per cent of outstanding stock of all concerns and about 4.5 per cent of the stock in concerns having such plans. In no case did employees own more than 18 per cent of the company's outstanding stock.¹⁶

All in all, the disadvantages of such plans appear to outweigh advantages, and they can be justified only in exceptional cases.

Exercises and Problems

1. Contrast the conditions under which time wages and piece rates are likely to be most satisfactory.
2. Calculate weekly wages and unit labor costs for each of four workers when the Taylor standard piece rate is \$5, the sub-standard rate is \$3, the standard weekly output is 4 units, and workers' production per week is as follows: *A*, 6 units; *B*, 5 units; *C*, 4 units; *D*, 3 units.
3. Assume that the same workers are placed on the Halsey plan, with normal output at 4 units per week, a normal time rate of \$20 per week, and a premium of 50 per cent. What will weekly wages and unit labor costs for each worker total?
4. Assume conditions similar to those of exercise 3, but with employees working under the Rowan plan with its usual premium and a guaranteed weekly wage of \$20. Calculate weekly wages and unit labor costs.
5. Assume standard output at 4 units per week of 40 hours, normal weekly wage of \$20, with a guaranteed minimum of \$20, and the 100 Per Cent Premium plan for these workers. Calculate weekly wages and unit labor costs.
6. If standard output is set at 4 units per week of 40 hours and the standard hour rate is 60 cents per hour applicable to 90 per cent standard

¹⁶Hardman, J. B. S., and associates, *American Labor Dynamics*, New York: Harcourt, Brace & Company, Inc., 1928.

and above, with a guaranteed weekly wage of \$21.60, calculate weekly wages and unit labor costs for these workers under the Standard Hour plan.

7. Assume that these workers were paid according to the Gantt plan, with standard production set at 5 units per week of 40 hours and a normal wage (guaranteed) of \$18, with a 20 per cent premium. What will weekly wages and unit labor costs be under these circumstances?

8. Summarize the major considerations to be taken into account in selecting a satisfactory incentive wage system.

9. Outline the major provisions of employee stock ownership plans.

10. Management has instituted a system of incentive wages throughout one department, and it is anxious to discover whether its effects upon unit costs have been advantageous. It compares costs for ten weeks prior to and ten weeks following the adoption of the new arrangement, as shown in the tabulation below. Analyze the data to discover whether there has been a significant change, by reference to the standard error of the difference between two means.

Week	Unit Cost Before Change	Unit Cost After Change
1	\$1.80	\$1.40
2	1.75	1.40
3	1.90	1.50
4	2.00	1.55
5	1.85	1.65
6	1.70	1.75
7	1.65	1.60
8	1.70	1.80
9	1.50	1.95
10	2.15	2.40

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CHAPTER XIV

Wage Policies

THE preceding chapter is devoted to a discussion of methods of wage payment, especially the incentive arrangements that are becoming increasingly common in modern industry. In contrast, it is the purpose of this chapter to consider what may be regarded as definitive factors to be taken into account in formulating a satisfactory wage policy and in evaluating existing wage policies. Considerations to be regarded are of many types, some more and some less important. It is essential, however, that management have a clearly defined wage policy, a position with respect to its whole wage relationship with employees, and such a policy should be based upon a careful regard for each of the considerations to be mentioned in succeeding paragraphs.¹

Permanent status of wage earners. As a primary consideration, it must be recognized that wages play a much more important part in a society in which wage earning is a permanent status than in one where the wage earner can confidently expect to leave the class of wage earners to become an independent artisan or employer. Under the usual conditions of the early guild system, for instance, the journeyman, and even the apprentice, could reasonably expect to become a master craftsman, an employer, after his period of service as a wage earner. In some fields of economic activity, a similar condition still prevails, but, for the great mass of modern workers, wage earning is a permanent status, and

¹See, Mitnitsky, M., "Wage Policy Today and Tomorrow," *International Labor Review*, September, 1935, p. 14*ff.*; "Salary and Wage Policies During the Depression," New York, National Industrial Conference Board, 1932; *Wage Determination; Current Policies and Practices*, Ann Arbor, Bureau of Industrial Relations, University of Michigan, 1937.

their livelihood throughout a whole lifetime must come from wages.

Under the circumstances, the social and personal adequacy of wages has become increasingly important. The worker's standard of living, in the future as well as in the present, must be adapted to his prospective earnings from wages. And, save for such control as workers may exert over wages by collective agreement, their whole living scales and standards are dependent upon the relatively impersonal forces that tend to set competitive wages. This condition must be contrasted with the medieval system in which wages were established by the church at what was regarded as a "fair" level (that is, a level at which the worker could maintain his social and economic status) and with the situation in this country only a few years ago, when workers always had the option of establishing themselves as independent entrepreneurs upon the free land then available. In modern industry, wages, in large measure competitively determined, are the long-time source of a livelihood for the great class of wage earners who are entirely dependent upon employment provided by others for their livelihood. It is for this reason that managerial policies with respect to wages have become so important to all modern wage earners.

Legal considerations. Certain features of modern wage policies are determined, in the United States, by law. Many of the states, for instance, prescribe the time and manner of payment of wages, and some of them place definite limitations upon the place of payment. The most common provision with respect to time of payment requires that workers be paid at least twice per month. Usual restrictions on the place of payment prohibit paying workers in saloons and barrooms. Provisions as to the manner of payment generally prohibit or restrict the use of scrip or other forms of purchase orders for goods and require payment in cash or negotiable check. State statutes vary with respect to other regulations on wage payments, but it is common practice to regulate the amounts and types of deductions for fines,

breakage of tools, and special benefit provisions, such as pensions, insurance, and the like.²

For certain types of employment, minimum wage legislation is an important consideration in determining wage policies. Such legislation ordinarily sets a minimum below which no employee may be paid. Some of the laws provide a definite figure, while others authorize a commission to set the figure and to adjust it from time to time to take account of changes in living costs.

Legislation of this type is not new. It is said to have originated in Australia, and Great Britain enacted its first minimum wage law in 1909. The first legislation in the United States was that of Massachusetts, passed in 1912. A number of states followed that lead, but in 1923, the United States Supreme Court held the law of the District of Columbia unconstitutional, on the ground that it improperly interfered with freedom of contract, and specifically criticized the stated basis for determining the minimum wage, which was described in the act as the cost of living and the amount necessary to protect health and morals.³ Accordingly, subsequent state laws added an additional consideration, described in the law as the fair value of the services rendered. In 1937, twenty-two states, the District of Columbia, and Puerto Rico had legislation of this type.

The legal status of such legislation was not clear, but it was generally believed that the added consideration incorporated in the laws following the decision in the Adkins case had given them a reasonable assurance of constitutionality. On June 1, 1936, however, the United States Supreme Court held the minimum wage law of the state of New York unconstitutional as it applied to adult women. The Court took the position that it had not been asked to reconsider the decision in the Adkins case but only to decide

² Schram, Jennie Lea, "Do They Pay by Cash or Check?" Chicago, Illinois Chamber of Commerce, June 10, 1929; Commons, John R., and Andrews, John B., *Principles of Labor Legislation*, pp. 32, 50-56, 60, 496, New York, Harper & Brothers, 1927.

³ *Adkins v. Children's Hospital* 261 U.S. 525 (1923).

whether the New York statute was distinguishable from the one which it had held invalid. The opinion declared that "the state is without power to prohibit, change, or nullify contracts between employers and adult women workers as to the amount of wages to be paid." It further held that any measure that "deprives employers and adult women of freedom to agree upon wages, leaving employers and men employees free to do so, is necessarily arbitrary."⁴

The action necessarily implied that all other state laws of the same type were similarly unconstitutional. But there was evident popular disapproval of the decision, upon which the court was divided five to four. A case involving a similar statute of the state of Washington was brought before the Court shortly thereafter, and on March 29, 1937 in another five to four decision, the court reversed its earlier position and held the act constitutional. It justified its reversal by the declaration that, whereas the former case had not raised the question of the propriety of the Adkins decision, the Washington case did so, and the court was, in effect, reconsidering and reversing the 1923 decision.⁵ It appears, therefore, that minimum wage legislation for women and children is constitutional and must be taken into account in formulating wage policy.

Adult male workers have not generally been included in the coverage provided by this type of legislation. Many such workers have, however, been affected by a similar type of regulation that has equally important implications for wage policies in certain industries, the legislation known as *prevailing wage laws*. All states have enacted such laws, and the federal government has its Davis-Bacon Act of 1935. The acts provide that all workers on construction financed with public funds shall be paid at rates equal to prevailing scales for such labor in the localities in which the work is undertaken. The determination of prevailing scales is ob-

⁴ *Morshhead v. People of the State of New York ex rel. Tipaldo*, 298 U.S. 597, 56 S. Ct. 918.

⁵ *West Coast Hotel v. Parrish et al.*, October Term U.S. Sup. Ct., 1936, 293.

viously a difficult task. The federal act entrusts this function to the Department of Labor, which has defined its conception of prevailing rates as follows:

1. The rate of wages paid in the city, town, village or other civil division of the state (hereinafter referred to as the locality) in which the work is to be performed, to the majority of those in the corresponding classes of laborers or mechanics (hereinafter referred to as the crafts) on projects that are similar to the contract work; or
2. In the event that there is not a majority paid at the same rate, then the rate paid to the greater number, provided such greater number constitutes thirty per cent of those so employed; or
3. In the event that less than thirty per cent of those so employed receive the same rate, then the average rate.⁶

The Works Progress Administration has recently published a summary of prevailing wages for a number of occupations in more than one thousand localities throughout the nation.⁷

The Canadian House of Commons in 1900 adopted a resolution that represents an excellent statement of the prevailing wage position, and the policy thus defined has been administered since that time by the Dominion Department of Labor. The resolution is brief and may be quoted in full as follows:

That it is resolved that all government contracts should contain such conditions as will prevent abuses which may arise from the subletting of such contracts, and that every effort should be made to secure the payment of such wages as are generally accepted as current in each trade for competent workmen in the district where the work is carried out, and that this House cordially concurs in such policy and deems it the duty of the Government to take immediate steps to give effect thereto.

It is hereby declared that the work to which the foregoing policy shall apply includes not only work undertaken by the Government itself, but also all works aided by grant of Dominion public funds.

The constitutionality of prevailing wage legislation has not been seriously questioned, for it is a fairly well-established principle that federal, state, and local governments may specify whatever conditions they desire for public em-

⁶ Regulations prescribed by the Secretary of Labor, September 30, 1935.

⁷ "Local Wage Rates for Selected Occupations in Public and Private Construction, 1936," Washington, Division of Research, Statistics, and Records, Works Progress Administration, 1937.

ployment. Obviously, all contractors who undertake public projects must take these considerations into account.

Recently, an extension of the principle of prevailing wages has appeared in federal legislation. The Walsh-Healey Act of 1935 requires that all those who furnish the federal government with goods and supplies on contracts involving an aggregate of more than ten thousand dollars must certify that employees engaged in the production of such goods have been compensated at prevailing wage rates and have been employed under conditions regarded as standard. It has been frequently suggested that the principle of this act should be extended to include all purchases of federal and state governments.

Union scales. If operations are carried on upon a closed shop or preferential union shop basis, or if unionists are employed, then union scales and wages defined by collective agreements are a fundamental consideration in wage policy. For some organizations, wage rates and wages are determined by collective agreements covering extensive areas; for others such agreements are only local in scope. One common problem they occasion is the adjustment of wages for non-union employees. Most commonly, there is effort to prevent discrimination between union and non-union workers, but there may be a recognized differential. Information as to union scales may be secured from the unions directly, from their publications, from state labor departments, and from public employment offices.³

The going wage. Considerable attention is frequently and properly given to the so-called going wage for each occupation. The going wage is similar to the prevailing wage described in federal and state legislation. It is that wage commonly paid by other employers, and its significance arises in part from the fact that employees tend to expect that rate of payment and in part because the fact that it is

³See, for instance, Peterson, Florence, and Rauth, C. F., "Union Scales of Wages and Hours in the Building Trades," Washington, Bureau of Labor Statistics, Bulletin No. 626, December, 1936.

the prevailing wage suggests that it closely approximates the actual commercial value of employees' services in the occupation.

Several sources of information as to going wages are available. If there are other firms using the same types of labor in the locality, then current rates of pay are likely to be generally known. Trade journals frequently carry information on the subject. Union officers, business agents, and members are well acquainted with existing scales for unionists. Local public and private employment offices can generally provide information as to current wages for almost all occupations. For comparisons of local wages with those of other localities, reference may be made to the *Survey of Current Business*, which carries as a regular series composite figures for all factory wage earners—male and female; skilled, semi-skilled, and unskilled—and special series for workers on construction, railways, road building, and in the steel industry. Much more detailed information is available in the *Monthly Labor Review*, which publishes current series describing wage changes in more than one hundred industries, both manufacturing and non-manufacturing.⁹ Their usefulness is seriously restricted, however, because they do not generally distinguish occupations.

Differentials between men and women. A troublesome feature of wage policy, in several industries, is the fact that both men and women are employed in similar operations and are paid differently for practically identical performance. The actuality of wage differentials between men and women is beyond question; it has been found in all sections of the country. An early study in New York state, for instance, showed women's wages, on the average, to be 54.5 per cent of those paid male workers. More than twenty-five of the industrial codes adopted under the National Industrial Recovery Act included provisions for such dif-

⁹ See Frain, H. La Rue, "Wage Levels between Firms," *American Economic Review*, December, 1931, Vol. 21, No. 4, pp. 620-635.

ferentials, and proposed labor standards bills include similar provisions.¹⁰ In textiles, the differential was found to amount to 28 per cent of men's wages; in shoes, it was 36 per cent. A study by the National Industrial Conference Board found that women worker's wages average about 30 per cent less than those of men.¹¹

There are many reasons for these differentials, and absolute equality in wages, even for identical performance, is not necessarily to be regarded as sound wage policy. On the other hand, it is to be expected that women's wages as a whole should be lower than those paid men. Women, as a rule, enter the lower paid occupational groups, and they represent age, racial, and nationality groups that are paid less than those entered by men. Furthermore, a smaller proportion of women workers is organized. Women workers are much less mobile than males, being restricted by family relationships. They do not have, on the average, either as much training or as much experience as men. For all these reasons, differentials in aggregate wages paid to men and women are to be expected.

Even where women perform the same operations as men and do so as efficiently, there is some justification for discrimination. The overhead cost of employing women is greater than that for men, a fact that makes the net value of women's services somewhat less than that of men. Increased overhead arises out of legal requirements that employers of women provide rest rooms and other similar facilities and from the fact that women are less regular in attendance and show a higher rate of labor turnover. In some cases, campaigns for "equal wages for equal work" are based upon a recognition of these differential costs, and

¹⁰ See Pidgeon, Mary E., *Employed Women under N.R.A. Codes*, Washington: Women's Bureau, Bulletin No. 130, 1935.

¹¹ See, Elliott, Margaret, and Monson, Grace E., *Earnings of Women in Business and the Professions*, Ann Arbor, Bureau of Business Research, University of Michigan, 1930; Dickinson, E. C., *Compensating Industrial Effort*, p. 237, New York, Ronald Press Company, 1937.

they aim to make it unprofitable for employers to hire women workers, so that men may have their positions.

Living wages. Increasing popular consideration has been devoted to what is generally described as a "living wage," and managements everywhere have had to take cognizance of the popular feeling that industry should provide a living wage. The term is loosely used, and no one knows exactly what it means. Apparently, it does not mean a wage that just permits physical existence, but has, rather, a conception of a scale of living considerably above subsistence. If the idea can be defined, it means that all workers should be able to live on their wages upon a level popularly regarded as decent and proper.

So defined, it represents an objective with which management will find itself in entire accord, and it emphasizes the importance of costs of living as a factor in setting wages. If wages are to provide any stable living scales, they must constantly take account of changes in living costs, and many managements seek regularly to adjust wages to such changes. The Bureau of Labor Statistics reports increasing numbers of firms that consider changes in cost of living in making wage adjustments, and numerous disputes have been settled only after such adjustments.¹² Some firms, including the H. H. Franklin Company of Syracuse, New York, the Cheyney Brothers Manufacturing Company of South Manchester, Connecticut, the Holt Manufacturing Company of Peoria, Illinois, and numerous others, have for a long time maintained careful measurements of living costs for their employees. Other firms make use of regional indexes prepared by the Bureau of Labor Statistics, by state universities and other research agencies, and still others depend upon the nation-wide series of cost of living indexes. Many depend on local cost of living indexes made available for 32 individual cities in the United States by the Bureau of Labor Statistics. These local indexes use the

¹² See *Use of Cost of Living Figures in Wage Adjustments*, Washington, Bureau of Labor Statistics, Bulletin No. 309, May, 1925.

average of 1923-1925 as a base and those for 19 of the cities extend back to 1914.¹⁸

There are two cost of living indexes currently available and national in scope. Both were begun at the time of the World War as a means of providing an equitable basis for adjustment of workers in war industries. One is prepared by the Bureau of Labor Statistics. It extends back to 1913, and is available in the *Monthly Labor Review* on a semi-annual basis until 1935, when quarterly reports were initiated. The other is prepared by the National Industrial Conference Board, and is reported monthly in the *Survey of Current Business*, as well as in the regular *Letter to subscribers*.

National data may or may not be representative of changes in living costs in any locality or for particular groups of workers, for which reason increasing numbers of concerns have begun to maintain their own local measurements of changes in retail prices. Many of them are quite inadequate and provide no fair basis for estimating current changes, while others are properly prepared and may be effectively used for time-to-time comparisons.

Measurement of costs of living. The foundation and essential beginning of any satisfactory measure of changes in costs of living is a budget study to determine what workers buy with the wages they receive. Both of the nationwide series mentioned in preceding paragraphs make use, for this purpose, of an extensive study of some 12,096 family budgets, representing 92 localities scattered throughout the nation, undertaken by the Bureau of Labor Statistics in 1917 and 1918. Obviously, the study is seriously out-of-date, and the Bureau has in process an even more extensive and intensive study of present-day wage-earners' budgets. When the results are available, they will be used to effect necessary changes in the weights accorded various items

¹⁸ See, Leeds, Morris E., and Balderston, C. C., *Wages, A Means of Testing Their Adequacy*, Philadelphia, University of Pennsylvania Press, 1931; Falkner, R. P., "Wage Differentials in Manufacturing Industry," National Industrial Conference Board Service Letter, April 30, 1936.

included in these budgets and thus to adapt calculations to present conditions.¹⁴

Upon the basis of such studies, it is possible to calculate what portions of wage-earners' incomes are expended for various types of goods and services, and changes in the cost of living may then be evaluated by continued measurement of the prices of various items in the budget. Obviously, it is necessary to weight such prices in terms of their importance in the total budget. The National Industrial Conference Board, for instance, distinguishes five general classes of items and estimates the proportion of each in the total budget as follows:

Food	33%
Shelter	20%
Clothing	12%
Fuel and Light	5%
Sundries	30%

Each of these classifications is then subdivided to indicate proportions of income expended for specific types of food, clothing, and other such items. For instance, the last of these, sundries, includes such subdivisions as household furnishings, 4.2 per cent; reading materials, 4.2 per cent; church, charity, gifts and insurance payments, 3.6 per cent each; recreation, 3.3 per cent. Proportions are calculated for such individual items as organization dues, physician's

¹⁴For detailed description and criticism of the methods used in such budget studies, see, Allen, R. G. D., and Bowley, A. L., *Family Expenditure; a Study of Its Variation*, London, P. S. King and Son, 1935; Peixotto, Jessica B., "How Workers Spend a Living Wage," Berkeley, University of California *Publications in Economics*, 1929, Vol. 5, No. 3, pp. 161-245; "Money Disbursements of Wage Earners and Clerical Workers in Four Michigan Cities," *Monthly Labor Review*, June, 1936, Vol. 42, No. 6, pp. 1744-1749; Williams, Faith M., "Revision of Index of Cost of Goods Purchased by Wage Earners and Lower Salaried Workers," *Monthly Labor Review*, September, 1935, Vol. 41, No. 3, pp. 819-837; "Money Disbursements of Wage Earners and Clerical Workers in 11 New Hampshire Communities," *ibid.*, March, 1936, Vol. 42, No. 3, pp. 554-563; Williams, Faith M., and Zimmerman, Carle C., *Studies of Family Living in the United States and Other Countries*, Washington, U. S. Department of Agriculture, 1935.

fees, carfare, drugs, toilet articles, candy, and tobacco; and prices are collected for 88 items in addition to rents. The monthly average of 1923 is now used as a base.

The Bureau of Labor Statistics index, based on the same original budget studies, distinguishes six major classes of items and accords them somewhat different proportions of the total, as follows:

Housing	21.2%
Clothing	13.7%
Fuel and Light	5.6%
Food	34.8%
House Furnishings	4.0%
Miscellaneous	20.7%

The index was originally based upon reports from a few cities, and 1913 prices were taken as the base. Recently, the series has been revised and placed on a 1923-1925 base. Semiannual figures are available for the years from 1919 to 1935. For the years 1914-1918, annual figures as of December in each year are available, and since 1935, the series has been published on a quarterly basis. As published, the index indicates changes in each of the major classes of items as well as in the whole. Furthermore, the indexes for each of the 32 cities may be obtained from the Bureau.

In providing local indexes of living costs for individual firms, the first step is the analysis of workers' budgets. Total expenditures are classified, and major classes of items are given appropriate weights, generally stated as percentages. Then it is customary to make up a "market basket" composed of representative items in each class. The prices of each of these items are noted, and they become the base prices for the entire series. Changes in these prices are noted, weighted, and combined to provide the continuing index.

It will be found that proportions of individual income expended for the specific items vary greatly from one locality to another and from one income class to another so that

weights found appropriate to one group of workers are not likely to fit another group. Thus, in a recent analysis of workers' budgets in five Pennsylvania cities, proportions of budgets expended for food varied from 31.9 per cent to 36.2 per cent, those for clothing from 9 per cent to 11.2 per cent, for housing from 15.4 per cent to 22.7 per cent, for recreation from 4.1 per cent to 5.9 per cent, for education from 0.1 per cent to 0.5 per cent.¹⁵ It is essential, therefore, if changes in costs of living for a particular group of employees are to be measured, that items in their budgets be weighted properly, in terms of actual expenditures of the group under consideration.

When weights for all items have been discovered (and it is convenient to express them in terms of percentages, since their total will then equal 100), the next step involves selection of specific goods in each class to be used as a basis for measuring changes in prices. The total of these goods makes up the content of the "market basket." Thus, the item, foods, might be represented by: (1) 10 No. 2 cans of peas, medium grade, (2) 40 pounds of potatoes, (3) 10 pounds of hamburger, (4) 30 pounds of butter (specified grade), and (5) few or many additional items. They should reasonably represent the purchases of the group under consideration.

Most of the indexes make use of what is described as the "weighted average of relatives" method for combining these individual prices. The steps in this method may be summarized as follows: (1) prices of representative items for each class are collected, and the total cost of these items for each class is noted; (2) these total costs are expressed as relatives or percentages of the total costs for this class during the base period; (3) the relatives thus determined are weighted according to the proportions allocated to each class as discovered from budget studies; and (4) the

¹⁵ "Money Disbursements of Wage Earners and Clerical Workers in Five Pennsylvania Cities," *Monthly Labor Review*, June, 1937, Vol. 44, No. 6, pp. 1493-1508.

weighted relatives are totaled to provide the current index number.

It may be well, in order to illustrate prevailing practice, to refer to an example, somewhat simplified in order to shorten explanation. It may be assumed that a budget study discloses expenditures that are classified as follows:

Food	40%
Clothing	15%
Shelter	20%
Miscellaneous	25%

and it may be assumed that the items selected for the market basket to represent foods may be summarized as shown in Table VII. Other major classes will be similarly represented by specific items in the market basket, and, for purposes of illustration, it may be assumed that the total cost of items representing clothing in the base month is \$20, that of shelter is \$15, and that of the miscellaneous category is \$10.

TABLE VII
FOODS IN THE MARKET BASKET (ASSUMED)

Item	Amount	Price in Base Month	Total
Sirloin steak.....	5 lbs.	32¢	\$1.60
Pork chops.....	10 lbs.	36	3.60
Leg of lamb.....	2 lbs.	25	.50
Milk.....	30 qts.	10	3.00
Butter.....	5 lbs.	50	2.50
Eggs.....	5 doz.	40	2.00
Bread.....	30 lbs.	10	3.00
Peas.....	2 # 2 cans	15	.30
Sugar.....	10 lbs.	7	.70
Coffee.....	2 lbs.	25	.50
Potatoes.....	40 lbs.	5	2.00
Total food budget.....	....	..	\$20.00

Then, if in the next month, the cost of the same food items is \$25, that of clothing items is \$15, that of shelter is \$15, and that of the miscellaneous is \$12, the index for the second month would be calculated as shown in Example 20.

It is apparent, from the example, that the aggregate cost of all items has risen 11.25 per cent over the cost of such items in the base period. Changes in other months, it will be apparent, can be as readily measured.

Limitations of indexes. Indexes of living costs are always subject to serious limitations upon their use, although many of those who use them frequently ignore these limitations. The currently available series must be used with caution, if at all, in applications to specific groups of employees. Both of the series providing for national coverage are based on budgets for families of five, including two adults and three children, and would not therefore apply properly to such groups as public school teachers or unmarried clerical workers. Nor could they be expected to repre-

EXAMPLE 20

COST OF LIVING INDEX—WEIGHTED RELATIVES METHOD

Month	Prices				Price Relatives			
	Food	Clothing	Shelter	Misc.	Food	Clothing	Shelter	Misc.
Base Given	\$20 25	20 15	15 15	10 12	100 125	100 75	100 100	100 120

Month	Weighted Price Relatives (Price relatives × weights)				Total or Index
	Food	Clothing	Shelter	Misc.	
Base Given	40 50	15 11.25	20 20	25 30	100 111.25

sent any specific locality fairly. If local indexes are to be used, they may also require adjustment to the sizes and types of families involved. Furthermore, the two nationwide studies are based on budget studies made in 1917 and 1918. It is certain that many significant changes have taken and are taking place in all budgets. This constant

shifting of expenditures is one of the most serious shortcomings of all such indexes. New budget studies must be made at frequent intervals to discover and measure current changes.¹⁶ One item that has become of increasing importance, for instance, is transportation. Recent studies of some 1100 families in a number of Michigan cities have shown that from 58 to 68 per cent of the families studied own cars, and transportation costs amount to from 5 to 10.7 per cent of total budgets.¹⁷

Practically all budget studies have disclosed a tendency for proportions expended for luxuries to increase as savings grow, and proportions expended for necessities are increased in lower income groups. The tendency is known as Engel's law, and attempts have recently been made to state it in rather exact, mathematical terms.¹⁸ The tendency is clearly observable in the recent budget studies noted in the preceding paragraphs, where it was found that in families with annual incomes of less than \$300 per consumption unit, 40.9 per cent of the budget was expended for food and 5.2 per cent was spent for recreation, while in families having incomes of \$700 and over per unit, foods accounted for only 25.2 per cent of the budget and recreation required 5.8 per cent.

These differences make it difficult to apply cost of living indexes based on budget studies of one type of labor to any other group of workers. The latter may be characterized by important differences in budgetary features. Certainly, indexes based on studies of budgets of laboring class families can not properly be used to deflate incomes of non-laboring groups or of white-collar employees, and indexes developed in one locality or for the nation as a whole may or may not

¹⁶ See, "Cost of Living," *Monthly Labor Review*, December, 1936, Vol. 41, No. 6, p. 1725ff.; Bensey, M. Ada, *Cost of Living in the United States, 1914-1936*, New York, National Industrial Conference Board, 1936.

¹⁷ *Monthly Labor Review*, June, 1936, Vol. 42, No. 6, pp. 1744-1749.

¹⁸ See, Allen, R. G. D., and Bowley, A. L., *Family Expenditure: A Study of its Variation*. London: P. S. King and Son, 1935.

be applicable to employees in any district other than that in which the budget study has been made. It is for this reason that so many firms have found it necessary to prepare and maintain their own indexes.

Changing bases and linking. It is frequently desired to change the base of an existing series of indexes. Thus a series based on 1913 may be available, while it may be desired to show directly the changes since 1929. To make such an adjustment, it is necessary only to divide the whole series through by the index number representative of the new base (multiplying each quotient by 100 to maintain the usual decimal relationship). Thus the first series shown in Example 21 has 1935 as a base. Series B shows the same relationship with the base shifted to 1936.

EXAMPLE 21
SHIFTING THE BASE OF THE INDEX

Series A 1935 = 100		Series B 1936 = 100	
Year	Index	Year	Index
1932	80	1932	76.2
1933	75	1933	71.4
1934	85	1934	80.9
1935	100	1935	95.2
1936	105	1936	100.0
1937	110	1937	104.8

Sometimes two series are available representing overlapping periods of time, and it is desired to reduce them to a single series. If the overlapping involves but a single year, it is a simple matter to express each series as relatives of that year as a base, in which case the two series are readily combined. If the overlapping is more extensive, it is usual to calculate the ratio of the sum of overlapping years in the first series to the sum of overlapping years in the second, and then to apply this ratio to all items of one or the other series in order to make possible their combina-

tion. Thus if the two indexes appeared as shown in Table VIII, then the ratio of overlapping years,

$$\frac{98 + 100}{90 + 91} = \frac{198}{181} = 1.094$$

indicates that the first index in these years was 1.094 times as great as the second. Individual items of the first series

TABLE VIII
TWO SERIES TO BE COMBINED

Data: Assumed for purposes of illustration.

Series A		Series B	
Year	Index	Year	Index
1927	95		
1928	98		
1929	98	1929	90
1930	100	1930	91
		1931	85
		1932	80

may, therefore, be divided by this ratio to place the combined series on the base of the second, or the items of the second may be multiplied by this ratio to place the combined series on the base of the first. For the overlapping years, it is customary to average the actual index of the series whose base is to be used and the index for that year calculated by means of the ratio. The two indexes for each overlapping year are totaled and divided by 2. These two adjustments may be summarized as shown in Example 22.

EXAMPLE 22
COMBINING OVERLAPPING INDEXES

Year	Series A Base	Series B Base
1927	95	86.8
1928	93	89.5
1929	$(98 + 98.5) \div 2 = 98.25$	$(90 + 89.5) \div 2 = 89.8$
1930	$(100 + 99.6) \div 2 = 99.8$	$(91 + 91.4) \div 2 = 91.2$
1931	93	85
1932	87.5	80

Deflating money wages. It is often desirable to secure a current measurement of the purchasing power of money wages to evaluate the effects of changing living costs upon such purchasing power. Such a measure is generally referred to as a *real wage* and it is most commonly expressed as a relative of some period which is regarded as its base. This result is readily obtained, either by dividing actual wages in dollars and cents by an index of living costs appropriate to the group under consideration or by dividing an index of money wages by such a cost of living index. Sometimes it is desired to describe the "purchasing power of the dollar" rather than that of specific wages or aggregates of wages. This result is obtained by dividing one dollar by the current indexes of living costs. These calculations are illustrated in Example 23, which compares sample months, not in sequence, with a month regarded as the base of all the series.

EXAMPLE 23
DEFLATING WAGES

Data: Assumed for purposes of illustration.

Month	Cost of Living Index	Weekly Wage	Real Wage	Money Wage Index	Real Wage Index	Purchasing Power of the Dollar
	A	B	(B ÷ A) 100	C	(C ÷ A) 100	(B ÷ A) 100
1 (Base)	100	\$25.00	\$25.00	100	100	1.00
2	110	26.00	23.60	$\frac{26}{25} = 104$	94.6	.909
3	90	24.00	26.67	$\frac{24}{25} = 96$	106.7	1.11

Which of the forms of deflated measures—real wages, a real wage index, or reference to the purchasing power of the dollar—will be used will depend upon the purpose of the comparison, and it should be noted that if available money wage and cost of living indexes do not have the same base

period they may be readily adjusted to provide such a base and thus to facilitate the desired comparisons.¹⁹

Index number wages. The most direct adaptation of data representing changing living costs to problems of wage adjustment is that provided by what are called index number wages. Under this arrangement, generally provided by collective agreements signed by employers and workers, it is agreed that wages are to be adjusted upward or downward at stated intervals of time in accord with and in amounts proportional to changes in living costs. Such agreements ordinarily specify what index of living costs is to be used. Sometimes, indexes of wholesale prices are used in place of those representing costs of living, because the former are somewhat more sensitive and make it possible to adjust wages before changing living costs have affected workers' incomes seriously, since changes are generally reflected in wholesale prices in advance of their appearance in retail prices. Index number wages have been frequently used in England and in Denmark and are less commonly in use in other nations on the continent and in the United States. Here, organized workers have sometimes opposed them on the ground that they tend to fix living scales, that is, they do not provide for continued improvement in workers' economic status.

Family allowances. As early as 1914, another type of wage adjustment had appeared in France that affected wage policies in a number of industries, and the system, described as family allowances, has since spread and is widely used in France, Germany, Belgium, Italy and certain sections of Australia. Its basic purpose is to provide wages scaled according to the number of workers' dependents. In order that the arrangement may not result in discrimination against wage earners with large families, a fixed base rate is provided for all employees of each type,

¹⁹ See, Douglas, Paul H., *Real Wages in the United States, 1890-1926*. Boston: Houghton Mifflin Company, 1930.

and allowances are paid in addition to this base rate and from an allowance fund made up of equal contributions from all workers. Estimated amounts of allowances are calculated in advance, wages are reduced to provide the necessary total, and the latter is then divided among workers according to their number of dependents.

Family allowance systems have been generally extended, since their inception, and are now made compulsory by law for several millions of employees in the nations mentioned. Many of the extremely nationalist nations have seen in such systems a means of encouraging a growing birth rate, and experience suggests that this effect is realized, for there are more births, fewer still births, and lower infant mortalities among the families on allowances than among the remainder. Labor organizations have generally opposed the system, for the same reason that they oppose any arrangements calculated to increase the labor supply. The plan has never been made compulsory in any jurisdiction in the United States.²⁰

"Scientific" wages. It is frequently asserted by representatives of management in industry that their wages are "scientifically" determined. The idea behind such statements is identical with that frequently expressed by F. W. Taylor and numerous others that the performance of each kind of work in an organization is worth a certain amount of money, and it is based largely on the assumption that modern time study and cost accounting can ascertain just what contribution is made by each type of operative and can, therefore, provide an accurate evaluation of the services of that employee.

Such conclusions are not substantiated by careful analysis of the facts. They ignore an essential feature of all production costs—the fact that they are relative. If one type of processing were stopped, it would, in many cases,

²⁰ "French Law Providing For General System of Family Allowances," *Monthly Labor Review*, April, 1932, Vol. 34, No. 4, pp. 796-798; "Family Allowances in Belgium, 1931-1934," *ibid.*, January, 1936, Vol. 42, No. 1, p. 87.

completely void the value of all other steps in the procedure. At the moment, therefore, each step is essential, and from a longer viewpoint the relativity remains, for the value of any source of performance is the cost of getting the work done in some other manner. The value of a given group of workers, for instance, is the cost of substituting another type of employee or machine in the production process. The costs of such substitution are, however, always matters of estimate. They are never definitely known in any specific situation until the change is effected. It is the peculiar function of the entrepreneur to make such estimates and, if he can see more efficient possible combinations of labor and capital, to substitute these new technologies. He never knows, however, their absolute costs or their future unit labor costs, and, accordingly, he never knows exactly the value of any type of labor. No amount of time study, job analysis, or cost accounting, can provide such information.

This elementary consideration is clearly evidenced where labor costs are so high that production is unprofitable. In such a case it is obvious that the value of workers' services cannot be established by cost accounting. Their cost may be so established, and study will disclose their individual productivity and unit labor costs. But their value to management will depend not upon any such internal accounting and analysis, but upon the fact that they cannot be profitably employed, that, so far as that particular employment is concerned, their services have no value. In other words, in a large share of all industry, costs are price determined rather than price determining.²¹

Economic basis for wages. If any scientific basis of wage determination can be described, it must be stated in terms of economic principles. There are economic forces or tendencies that influence wages, and the way in which they act has just been suggested in the reference to the fact that

²¹ See, Dickinson, Z. C., *Wages and Labor Relations*, Chap. IX. New York: Ronald Press Company, 1937.

most costs of production are price determined, that is, that the value of any contribution to production depends fundamentally upon the value placed by consumers on the finished product. The alert employer produces for one purpose, to sell his products at a profit. What he can pay for the various factors entering into the productive process depends upon the price he can get for his finished products. This simple fact, constantly obscured by false economic dogma, is highly important to the clear understanding of economic considerations basic to an intelligent wage policy.

One of the most common fallacies that tends to obscure clear understanding of underlying economic processes is that which urges that wage rates must be maintained under any and all circumstances, to the end that purchasing power may be sustained. It is argued that holding wage rates high will maintain consumers' buying power, which will, in turn, support prices and sustain employment.²²

The wage rate maintenance doctrine leads to serious fallacies in current thinking. It ignores the fact that many factors other than wages affect price levels, and it overlooks the highly important fact that, when there is a tendency for credit to tighten, that condition, combined with the reduced velocity of circulation of money, exerts an influence toward reduced prices that could not possibly be counterbalanced by maintaining wage rates. Furthermore, it ignores the rather obvious fact that if wage rates are maintained in a period of falling prices, employment must almost certainly be curtailed, since, if costs remain high, smaller quantities of goods can be sold. In other words, by and large, elasticity of demand is a real consideration; larger quantities will be purchased at low prices than at high prices. If, then, prices of a given factor are, in effect, raised by maintaining them when prices as a whole are falling, sales will

²² See, Welch, Emmet H., "Purchasing Power and Wage Policy," *Bulletin of the Taylor Society*, 1932-1933, Vol. 17-18, pp. 169-185; Dickinson, Roy, *Wages and Wealth*, Princeton, Princeton University Press, 1931; Soule, George H., Jr., "The Maintenance of Wages," *Proceedings of the Academy of Political Science*, January, 1932, Vol. 14, No. 4, pp. 89-92.

be restricted and employment must eventually be curtailed.²⁹

The elementary economic factors that determine wages include the demand for and the supplies of various types of labor, and the specific factors that must be recognized in any particular situation are conditions that tend to influence either the demand for or the supply of labor. The basic forces of supply and demand arise out of the facts that workers desire to sell their services, and that consumers want the products that these services make possible. The first of these conditions creates the supply of a given type of labor, while the second determines the demand for such labor. The meeting of supplies and demand in the labor market tends to fix wages at any given time, and the scope and nature of the market determine how smoothly and exactly this pricing process works.

There are always conditions that tend to interfere with perfectly free marketing of labor. Among the most important are the immobility of workers or of capital, the absence of accurate knowledge of market conditions on the part of workers and employers, and the existence of effective control either of labor supplies, through organization, or of the demand for particular types of workers, through monopolistic control of the market by an employer or group of employers. Workers' immobility may arise from family relationships or it may result from the inability of the worker to adapt himself to other types of employment than the one under specific consideration. In either case, labor will not be able to exercise complete freedom of choice, as is necessary if basic economic tendencies in the wage-fixing process are to operate freely. The immobility of capital may arise from its investment in plants or specialized types of machines. Ignorance of market conditions prevents

²⁹ Rorty, Malcolm C., "The Necessity for Wage Reductions in the Present Crisis," *Proceedings of the Academy of Political Science*, January, 1932, Vol. 14, No. 4, pp. 83-102; Lough, William H., and Gainsburgh, Martin R., *High-Level Consumption: Its Behavior; Its Consequences*, New York, McGraw-Hill Book Company, Inc., 1936.

workers from knowing of possible other uses for their services, or it may operate to prevent management and labor from knowing of existing supplies of and demands for labor in other localities which go to make up the whole market for this particular type of labor. Control of the labor supply may effectively influence the price at which it is available, while monopolistic control of employment may set otherwise impossible upper limits on wages to be paid in the market.

Within these and other less important limitations, the basic economic tendencies in the various labor markets operate. The markets are defined by the specific types of labor in which they deal, and it is necessary, in order to simplify explanation of the wage-fixing process, to assume that workers of each type are sufficiently uniform so that management thinks of workers as readily interchangeable, because they are a homogeneous group. It is further assumed that workers may be added to the total of employees as individuals, a situation that may or may not be possible, depending upon technological conditions. The assumption only makes it somewhat easier to grasp the operation of the process and is not at all necessary to its general operation. Under such circumstances, workers have their individual prices at which they will accept employment. A few of them are available at lower wage levels. The whole supply may be pictured graphically as shown by the line SS' in Figure 27, where, of course, arbitrary wages and numbers of workers have been assumed. According to the assumed data pictured there, the total market includes some 3250 workers. Some 500 of them, anxious to secure employment, are willing to work for \$4 per day, and an additional 1500 become available as wages approach \$6, while 500 more are willing to work for \$8. Furthermore, there are some 750 additional workers, perhaps tentatively retired or possibly occupied at other pursuits, who will come into the market if wages are advanced to \$12. As the curve indicates, the numbers available increase continuously with increasing wages, so that

numbers available at any intermediary point may be readily ascertained from the curve.

Meanwhile, employers in the market are considering the value of various numbers of employees to them. Each employer, in effect, constructs a miniature demand schedule or curve of his own. A certain minimum number of workers is an absolute necessity, and the employer will, if neces-

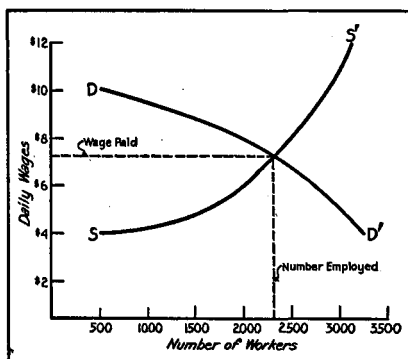


Fig. 27.—Simplified Operation of a Labor Market.

sary, pay very high wages to secure that number. At lower prices, he can use additional numbers, and this process continues to the point where he may find it profitable to use hand labor instead of machines if labor is cheap enough. The total demand for this type of labor (in this particular market) is the sum of individual employer's demand curves and appears somewhat as shown by DD' in Figure 27. In the hypothetical case pictured in the Figure, employers would apparently use a minimum of 500 men at \$10 per day. At \$8, some 2000 employees would be employed, and larger numbers can be taken care of at lower wages.

The results of these two forces or influences, the supply of labor and the demand for it, are apparent from the chart.

There it appears that some 2300 workers will be employed at a wage of approximately \$7.50 per day. If there were a total of 3250 workers available at all prices, it is apparent that some 950 of them will have to seek employment elsewhere.

This analysis of the economic forces that determine wages is generally described as the *marginal productivity theory* of wages. It is so called because the curve of demand for labor represents entrepreneurs' estimates of the marginal productivity of various numbers of workers. In other words, the reason any employer is willing to hire any additional worker at a particular wage is the fact that the resulting total number will be worth that much each, in terms of what he estimates to be their contribution to the value of the finished product. Since all workers are interchangeable, each is worth as much as another, but each addition makes the value of all workers somewhat less. That is why the DD' curve slopes downward to the right.

It must be understood that what this type of analysis describes is a tendency. Various factors, including especially those mentioned in introducing it, prevent its perfect operation in practice. But the tendency is as elementary and unmistakable as is the law of gravitation, and the process it describes is much like that of gravitation in that it is almost never allowed to operate freely in actual practice. The fact that it is modified does not, however, nullify its essential usefulness in explaining how wages are determined any more than the fact that gravitation seldom attains perfect freedom of operation in practice renders the principle useless.

Because it describes an hypothetical situation, the situation described by the theory is never typical of an actual situation, although the common labor market shows few conditioning factors. Rather, it is an analytic tool, to be used in understanding underlying tendencies in the wage-fixing process. And it can never be taken as an explanation

of individual wage differentials. It explains tendencies operating to determine wages of groups of workers assumed to be homogeneous and interchangeable. It never explains wages of individual workers or specific wage rates at a particular time or place.

Basic factors. Moreover, the theory merely describes existing tendencies; it does not explain why demand and supply schedules are as they are. As a matter of fact, it cannot do so completely, for many of the conditions that combine to define existing supplies and demands are non-economic in nature. For any given employer, these conditions may, however, be highly important as defining his demand for labor and the supplies available to him. Some of the most important conditions affecting supplies of and demand for particular types of workers may, therefore, be given brief attention.

Among the circumstances affecting supplies, one of the most important is the native ability required in the occupation. Another is the amount and type of training necessary, and still another is the situation with respect to the availability of training. In some cases, training is available in public or special vocational schools; in others, unions may control it through their regulation of apprenticeship. Age limitations may affect supplies, and the risk of failure is an important consideration in many occupations. In some instances, various types of non-monetary compensation may affect supplies, as is the case where pleasant working conditions, or prestige, or authority, or public recognition are associated with the work. All such conditions, because they affect the number of workers available, will influence wages, and any influence exerted by management upon them will be reflected in wages.

Similarly, a variety of conditions affect demands for labor. Most important, perhaps, is the cost of other types of workers who might be substituted with a rearrangement of facilities and productive processes. The cost of capital is of im-

portance, since capital is a substitute for labor. If capital is expensive and scarce, that condition may make labor more valuable. In the aggregate, however, increasing quantities of capital generally tend to make wages higher, for they increase the demand for operatives to use it and they increase the productivity of the labor that puts the capital to work. The general "state of the arts," as Adam Smith described the prevailing technology, affects demands for labor. Insofar as management can exert an influence upon these conditions, it can control some of the factors that tend to set wages.²⁴

No single policy-determining factor. From the variety of conditions considered in this chapter, it will be apparent that the factors to be taken into account in establishing or evaluating managerial wage policies are numerous and varied. There is no simple rule for determining the value of workers or for designing or maintaining a satisfactory wage policy. There are, however, certain fallacious theories of wages that may be avoided, and there are numerous conditions involving comparative wages in other industries and other localities, changing costs of living, legal limitations, and union regulations that must be given consideration. Alert management should be clearly aware of basic tendencies in economic forces that influence wages, and cognizant of the conditions that modify the action of these forces. It must recognize such conditions, and it may have to exert some control over them. If, for instance, the fact that training is difficult to secure is restricting supplies of workers of a certain type, it may have to provide such training. If the risks of failure in certain occupations are deterring many from entering it, then perhaps management may pro-

²⁴ See, Yoder, Dale, *Labor Economics and Labor Problems*, Chap. IX, New York, McGraw-Hill Book Company, Inc., 1933; Monroe, A. E., "The Demand for Labor," *Quarterly Journal of Economics*, August, 1933, No. 47, pp. 627-646; Hicks, J. R., *The Theory of Wages*, New York, The Macmillan Company, 1932; Cannon, Edwin, "The Demand For Labor," *Economic Journal*, September, 1932, Vol. 42, No. 167, pp. 357-370; Fisher, Allen G. B., "Education and Relative Wage Rates," *International Labour Review*, June, 1932, Vol. 25, No. 6, pp. 742-764.

vide ways of reducing that risk or of cushioning the effects of failure by providing alternative employment.²⁵

It is of fundamental importance that workers understand necessary limitations on possible wages. Management may well take employees into its confidence in explaining these limitations and interpreting the balance sheet and income account to workers. They have a right to know why funds available for distribution as wages are limited, and this is especially true in an era when "share the wealth" and "soak the rich" movements gain many gullible adherents. It has been calculated, for instance, that in the peak year, 1929, the average monthly earnings of employees in a number of large corporations engaged in manufacturing, mining, construction, transportation, and trade was \$119. If all wages, salaries, bonuses and other payments to personnel had been pooled and divided among employees, average monthly earnings would have been \$131. If dividends had been added to the pool, the average would have amounted to only \$147. Such facts are highly significant in making clear the fact that, after all, the income of any business is limited, and that which can be paid in wages is not determined merely by the whim of an employer.

Salary scales. One of the first steps in the evaluation of current or existing wage policies is that in which an attempt is made to discover what considerations have apparently been given greatest weight in determining wages. It is important to know what conditions are associated with existing wage differentials, whether management is paying for long service, performance on the job, or for family connections, personal affections, or other factors. Information on these points must be gleaned from a variety of sources, of which personnel records are probably most important, although interviews may prove more interesting. In evaluating such data as are available, some of the correlation techniques described in preceding and later chapters may

²⁵ See, for instance, Slocombe, Chas. S., "Labor Costs and Administered Prices," *Personnel Journal*, January, 1937, Vol. 15, No. 7, pp. 241-246.

be found helpful, as is suggested by the exercises at the close of the chapter.

Any comprehensive wage policy must include considerations of systematic promotion from one position to another. These considerations require detailed attention which will be undertaken in the next chapter. Closely related, however, is careful salary and wage classification, and brief consideration may be given to this feature of wage policy in closing this chapter.

Intelligent wage policies are dependent upon a perspective that clearly indicates existing wages and wage relationships among various types of employees, and, in many business organizations, it is possible to describe salary scales for various classes of work. In order to make such comparisons effective, positions must be classified, as described in the earlier discussion of job analysis and classification. It is also convenient to have such positions rated, thus indicating management's estimate of the value of each position to the organization as a whole. In measuring salary scales, the highest and lowest salaries or wages in each classification must be noted as defining the range within that classification. It is helpful, in visualizing existing conditions, if such ranges are plotted on graph paper where overlapping becomes immediately apparent, as does the relationship of various classes from bottom to top of the classification. Such a chart is shown in Figure 28.

In practice, it is convenient to use a semi-logarithmic type of graph paper for this purpose, a paper having an arithmetic scale on one axis and a logarithmic scale on the other. Classifications may be noted on the arithmetic scale while salary ranges are shown on the logarithmic scale. (The logarithmic scale has the advantage of showing equal ratios as equal distances; thus the distance from 1 to 2 is the same as that from 2 to 4, or that from 5 to 10. It displays, therefore, the *rate of change* from classification to classification, rather than the simple *amount* of change. Such paper may be readily prepared, if it is not conveniently available, by

noting the logarithms of the numbers from 1 to 10 on ordinary graph paper, labeling each such logarithm with its antilog, the original number. As many decks or cycles as are desired may be provided, simply by regarding the 10 of a lower cycle as the 1 of that above it.)

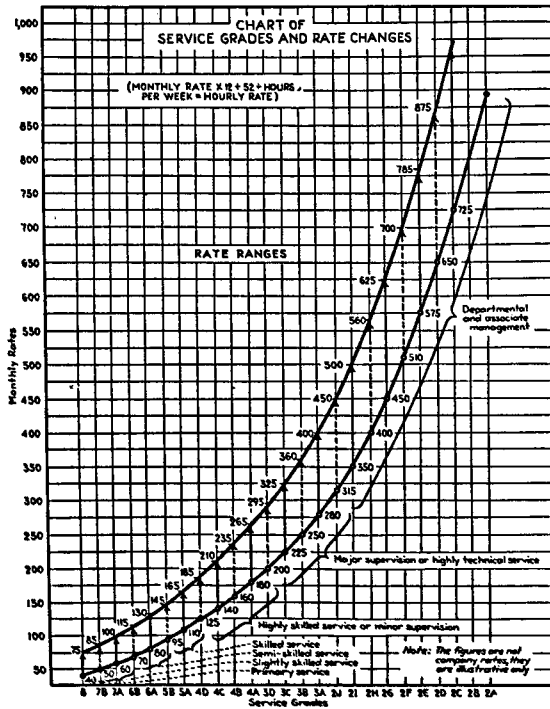


Fig. 28.—Graphic Portrayal of a Salary Classification. (Reproduced by permission from Hopwood, J. O., *Salaries, Wages, and Labor Relations*, p. 75. New York: The Ronald Press Company, 1937.)

It is necessary, of course, to reduce all wages or salaries to a daily, weekly, or monthly basis, so that they are comparable. The high and low salary in each classification may then be noted, after which their points may be con-

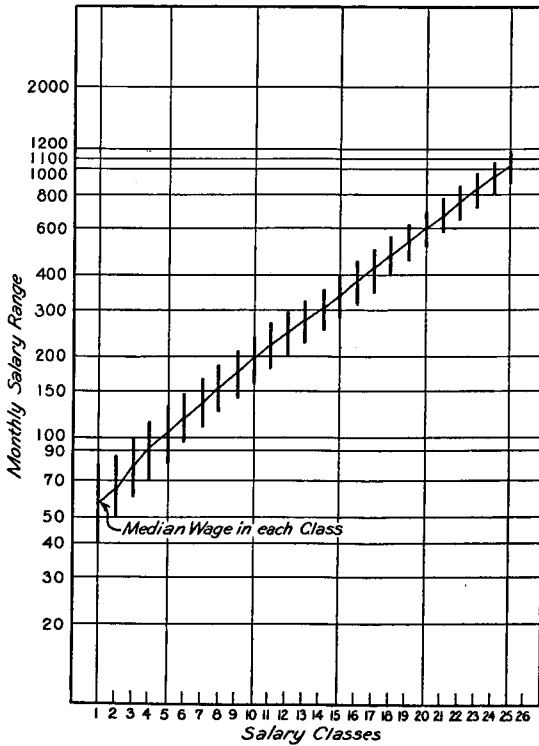


Fig. 29.—Salary Classification on Ratio or Semi-Logarithmic Scale.
(Data: Same as Fig. 28.)

nected by a line. From such a chart, of which Figure 29 is an example, a number of conditions with respect to existing salary or wage policy may be observed, and suggestions for desirable changes may be available from its analysis. It is desirable, for instance, that too great overlapping be avoided, because such coincidence tends to destroy the value of the classification. Obviously, there is little value in the classification, from the point of view of salaries, if two adjacent classifications practically coincide. The ranges within classifications are important, not as absolutes, but in relative terms. If all ranges were proportionate, then a straight line could be run through all minimum wages from lowest class to highest, and another straight line could connect all maximum wages. Such a condition would indicate that the ratio of lowest salaries to highest in each class was consistent. That is true, for instance, of classifications 8, 9, and 10, in the figure. The ratios of minimum to maximum wages are approximately $\frac{1}{11}$, $\frac{1}{11}$, and $\frac{1}{11}$ respectively. It will be noted that the same relationship prevails in classification 11.

If all classes had begun at the point of intersection with a straight line, it would have indicated that the minima of all classes rose in steady proportions, a condition to be desired in some industries and businesses. The range, in each class, may be similarly evaluated by observation. While it is vastly greater in aggregate amounts in the upper classes, where, for instance, class 25 ranges from \$900 to \$1200, or 33 $\frac{1}{3}$ per cent, the proportional range appears to decrease, for the lines become shorter in the upper classifications. The range in class 1 is greatest, running from \$40 to \$85, or varying by some $\frac{1}{2}$, or more than 100 per cent.

The rate of increase throughout the whole classification might be evaluated by running a line through mid-points or minima of each class. In this case, it apparently approximates 16 per cent from class to class, a rather high rate. Most classifications would probably show a lower rate of growth.

Suggestions for perfecting the classification and wage scale will arise naturally from such a graphic portrayal as that shown in Figure 29. It may be found, for instance, that classes overlap too extensively. The range within certain classes may be too great. The rate of progression may be too slow or too rapid. In many cases, the whole may be improved if maximum and minimum classes are lined up, on the ratio scale, so that the relative relationships with the classes remain fairly constant from bottom to top. This effect has been achieved in the classification used as illustrative of these principles. Unreasonable salaries will appear clearly, so that satisfactory adjustments are more readily made.²⁸ Generally, no reductions in existing wages or salaries are made, but it is understood that new appointments will be compensated for at appropriately lower levels. On the other hand, positions found to be under-paid are generally advanced as soon as possible.

Exercises and Problems

1. Prepare a brief report on one of the articles and studies mentioned in footnotes throughout the chapter.

2. The M Company maintains its own cost of living index for the community in which it operates. It uses the index as a basis of wage adjustment. The index is based on 1923 prices and a fixed weighting of the five items that enter into its computation. Weights are based on a budget study and are stated as percentages, as follows: food, 30 per cent; clothing, 15 per cent; fuel and light, 5 per cent; housing, 25 per cent; sundries, 25 per cent.

Given the price aggregates for the base month and for the other months indicated below, and using the weighted average of relatives method, calculate indexes for each of the months.

²⁸ See, Hay, Edward, "Constructing Salary Schedules," *Personnel Journal*, April, 1936, No. 4, pp. 350-356; Hopwood, J. O., *Salaries, Wages, and Labor Relations*, New York, Ronald Press Company, 1937; Lott, M. R., *Wage Scales and Job Evaluation*, New York, Ronald Press Company, 1926; Thorndike, E. L., and Beckwith, Burnham P., "Salaries of Executives," *Personnel Journal*, March, 1937, Vol. 15, No. 9, pp. 312-320; Clothier, R. C., "Organization for an Occupational Survey," *Journal of Personnel Research*, February, 1923, Vol. I, pp. 427-450.

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<i>Month</i>	<i>Food</i>	<i>Clothing</i>	<i>Fuel and Light</i>	<i>Housing</i>	<i>Sundries</i>
Base (Average of 1936)	\$36.00	\$9.30	\$3.75	\$30.00	\$22.50
Jan., 1937	27.80	7.12	3.28	18.80	20.67
July, 1937	27.72	7.44	3.26	19.40	20.80
Oct., 1937	27.88	7.83	3.28	19.90	20.85

3. A manufacturing concern, seeking to compare costs of living of its employees over a ten-year period, finds that there are available two indexes, one for the years 1928-1933, and the other representing the period 1932-1937, as follows:

<i>Index A</i>	<i>Index B</i>
1928 100	1932 100
1929 104	1933 104
1930 106	1934 106
1931 104	1935 110
1932 98	1936 111
1933 102	1937 112

Management wishes to provide a continuous index by linking the two available series. It seeks, also, to place the continuous index on two bases, 1928 and 1937. Prepare the two desired index series.

4. The following quarterly index of living costs based on the average of 1923 is the only local series available. Management wishes, for purposes of wage adjustment, to re-establish the series on a base representing January, 1933. Make the transposition.

<i>Month</i>	<i>Index (1923 = 100)</i>
January, 1933.....	73.7
April, 1933.....	71.5
July, 1933.....	75.2
October, 1933.....	78.0

5. Use the cost of living indexes available from the preceding exercise to calculate the purchasing power of the wage dollar for each of the given months in terms of 1923 dollars and also of January, 1933, dollars.

6. Use the following indexes of money wages and costs of living to prepare an index of real wages for each of the months.

<i>Month</i>	<i>Index Numbers: (1923 Avg. = 100)</i>	
	<i>Money Wages</i>	<i>Cost of Living</i>
January, 1937.....	71.0	77.5
April, 1937.....	78.9	78.4
July, 1937.....	74.9	79.1

Indicate the percentage changes in real wages between the months.

7. The following simplified summary presents average daily earnings and other significant data with respect to employees of the W Motor Supply Company.

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Employee	Average Daily Earnings in Dollars	Production in Units per Day	Years of Service
	Y	X ₁	X ₂
A	2	3	2
B	4	5	3
C	6	8	7
D	4	6	8
E	7	8	20
F	7	10	10
G	8	12	22
H	2	7	6
I	4	10	2
J	6	11	10

Chart the data to show interrelationships and evaluate the significance of correlations between earnings and each of the other conditions.

Collateral Reading

- Baridon, Felix E., and Loomis, Earl H., *Personnel Problems*, pp. 43-92. New York: McGraw-Hill Book Company, Inc., 1931.
- Dickinson, Z. C., *Compensating Industrial Effort*. New York: Ronald Press Company, 1937.
- Ford, Adelbert, *A Scientific Approach to Labor Problems*, pp. 73-92. New York: McGraw-Hill Book Company, Inc., 1931.
- Riegel, John W., *Wage Determination*. Ann Arbor: University of Michigan, Bureau of Industrial Relations, 1937.
- Scott, Walter D., Clothier, R. C., and Mathewson, S. B., *Personnel Management*, Chaps. XXI and XXII. New York: McGraw-Hill Book Company, Inc., 1931.
- Tead, Ordway, and Metcalf, H. C., *Personnel Administration*, Chap. XXII. New York: McGraw-Hill Book Company, Inc., 1933.
- Walters, J. E., *Applied Personnel Administration*, pp. 130-143. New York: John Wiley & Sons, Inc., 1931.
- Watkins, Gordon S., *Labor Management*, pp. 341-348. New York: McGraw-Hill Book Company, Inc., 1928.

CHAPTER XV

Promotion and Transfer

REFERENCE to classification of positions in Chapters IV and XIV and discussion of progressive increases in wages from class to class suggest promotions. Brief attention may well be given at this time to promotional policies of modern industry and to transfers, which are closely associated with promotions.

Promotions and transfers defined. At the outset, it may be well to consider the meaning of the terms involved and to distinguish them. The chief distinction hinges about variations in responsibility. Transfer involves moving employees from one department or division to another without effecting any significant increase in duties, responsibilities, skill required, or compensation. It is a movement from one job to another that requires approximately the same talents and responsibilities.

Promotion, on the other hand, is usually defined as a movement to a position in which responsibilities are increased, and, conversely, demotion is a shift to a position in which responsibilities are decreased. Promotion is, in a sense, an increase in rank, while demotion is a decrease in rank. Ordinarily, promotion is associated with higher earnings, while transfer may effect no change in wages, but the monetary consideration is not essential as the terms promotion and demotion are used in personnel literature. Presumably, promotion places employees in positions which carry greater prestige as well as increased responsibilities, and the reality of promotion is perhaps best assessed by reference to employees' attitudes toward the change involved.

It will be recognized that these definitions are somewhat arbitrary. That they are not rigorously followed in popular usage is quite clear. The principal purpose in stating them here is to provide terms that may be clearly understood in subsequent paragraphs. In practice, promotions are generally associated with increases in earnings as well as in responsibilities and rank, although there are periods, notably those of business recession, when frequent promotions are unaccompanied by salary or wage increases. In fact, it is not uncommon for promotions to be given in lieu of wage or salary advances at such times.

Reasons for promotions. Promotion is a highly important feature of managerial policy, a feature of multiple purposes. Most obvious is its use to reward employees for faithful service, meritorious performance, outstanding ability on the job, accomplishments in training programs or self-improvement, attendance, punctuality, accident avoidance, and other indications of desirable service. Sometimes, promotion seeks to hold employees of great potential ability. In many cases, it appears to be a reward for longevity of service, for merely staying with the firm, as is particularly true in seniority arrangements. It may express management's appreciation of the adaptability of the worker, his capacity to handle a variety of positions. Sometimes, it is a reward for personal loyalty, which tends to put promotions on a basis of favoritism and preference.¹

In most cases, promotion is not, however, a means merely of rewarding employees, but is, at the same time, a means of placing employees in positions where they are more valuable to management. It seeks to fill positions effectively by selection from within the ranks of present employees. It is an adjustment calculated to increase the value of personnel to management. It reduces labor turnover in so doing and, in many instances, solves problems of training by pro-

¹ See, Blanc, R. G., "Use Production Facts to Determine Rates, Raises, and Promotions," *Factory and Industrial Management*, January, 1930, Vol. 79, p. 55ff.

viding instruction on the job for higher positions to which workers may be promoted.

In the aggregate, frequent, well-selected promotions tend to maintain and improve the morale of the whole working force. They demonstrate management's interest in employees and its intention to provide for their advancement, and they thereby forestall much unrest and labor turnover. It will be apparent, of course, that if unwise promotions are general, if favoritism and preference are obvious in the promotional program, desirable results will be less notable, and dissatisfaction and frequent separations are likely to be unavoidable.³

Types of promotions. Management frequently distinguishes several types of promotions. All involve some increase in responsibility although the emphasis placed on this feature varies. In some cases, there is advancement in title or rank which may or may not be accompanied by increase in salary and which is generally described as *horizontal* promotion, because it does not involve a change in basic classification. Thus a junior clerk becomes a senior clerk without leaving the clerical classification. In other cases, promotion crosses classification boundaries. It involves distinct increases in opportunity, by providing additional training, different experience, increased responsibility or other distinctive changes. Ordinarily, such a shift removes the worker from his former department, and such promotions are frequently described as *vertical*.

Another frequent type of promotion involves no additional opportunities and only slight increases in responsibilities, but it is promotional because it provides additional privileges, comforts, prestige. Frequently given as a reward for long service, it may involve shorter working hours, or less rigorous attendance, or less strenuous activity, with only slightly greater obligations and possibly no advance in financial compensation.

³See, Dodge, Arthur F., "Smoothing out Friction in Inter-departmental Promotions," *Industrial Management*, January, 1930, Vol. 79, p. 244f.

Ordinarily, increases in pay without any of these other changes would not be regarded as promotions, although there are obvious exceptions to this rule in popular usage.

Systematic promotions. In recent years, managers charged with responsibility for personnel policies have given increasing attention to promotional arrangements that are generally described as systematic promotion plans. They involve a rather wide variety of programs, but the essential feature of all of them is their provision of definite principles governing promotions and in terms of which promotions are planned, rather than merely making such shifts when and if opportunities appear.^a

Systematic promotion requires, as an elementary step, careful job analysis, description, and classification, for it can be builded only about a careful analysis of the interrelationships existing between jobs throughout the organization. Jobs are classified and their relationships to other positions charted to provide clear recognition of the channels of natural movement from one job to another. Positions may be adjusted and rearranged so that one prepares workers for another, to the end that blind alleys may be reduced in number and a natural course of advancement throughout the whole organization may be provided. Where blind-alley positions are unavoidable in that such jobs cannot be so arranged as to be preparatory for anything better, such positions are so limited as to facilitate filling them with workers who do not expect advancement, either because of their mental and temperamental characteristics or because of recognized physical or other handicaps.

Employees are made fully aware of the implications of such plans and are encouraged to expect advancement and to realize management's interest in their advancement. At the same time, they are clearly informed of management's expectation that they will prepare themselves for such ad-

^aSmith, E. D., "Essentials of a Rational System of Promotion," *Management Review*, February, 1933, No. 22, pp. 49-50; Gemmil, P. F., "Methods for Promoting Industrial Employees," *Industrial Management*, April, 1924, p. 235*f*.

vancement. Naturally, under such circumstances, these plans are closely related to training programs by means of which workers are enabled to improve themselves and justify advancement.

Rating systems are also closely related to arrangements for systematic promotions; for employee ratings, together with training grades and test scores of various sorts, are used to select promotional material and to gauge the desirable rapidity of promotion. Systematic promotion systems, for this reason, have been generally confined to firms which have established rating systems, together with training arrangements of some sort, and in which jobs have been carefully analyzed.

Most systems make use of some sort of graphic portrayal of promotional lines and opportunities associated with each position. Such "promotional charts," "opportunity charts," or "fortune sheets," as they are variously described, clearly distinguish each position and, by lines and arrows connecting various jobs, show the lines of advancement up to and away from each position. Such a graph is not illustrated here, because it requires a large chart to portray the interrelationship of positions in an organization of any size, but jobs are ordinarily designated by circles or squares, and the whole organization appears as a sort of pyramid, with large numbers of minor positions and smaller numbers of positions involving increasing responsibility.

Values of systematic promotion. There are numerous fairly obvious advantages to be gained from the provision of systematic promotion plans. Probably most important, from the management's point of view, is the fact that it provides for future labor needs by establishing definite routes of advancement into positions of increasing responsibility. With such plans, management knows where it can and will secure future supervisors, department heads, and executives. It plans in advance for their need and prepares them by a definite succession of preparatory activities.

Almost equally important is the fact that such plans have

a highly healthy effect on worker morale by indicating to employees a definite plan for their individual advancement. By so doing, turnover is reduced, and incentives are provided for serious attention in training programs, for application to work, and for constant maintenance of interest in the job. The fact that workers are, in effect, promised definite advancement if they show appropriate interest and ability gives them a feeling of permanence and of assurance that the higher positions will not be filled from outside their ranks, so that the whole tone of employee attitudes is advantageously affected.

In many cases, moreover, where the systematic promotional arrangements are perfected throughout the whole organization, they provide a definite economy in total personnel costs. Because increases are definitely promised to deserving employees, immediate wages and salaries may be somewhat lower than would otherwise be possible. At the same time, where vacancies appear high up in the organization, an advancement may frequently be made, affecting a whole series of positions, with a net saving in their total costs. The top position, and a large number of those in the line of advancement below it, may be filled at lower salaries than were paid to those who had formerly held the positions for a considerable period of time and had received salary advances above the minimum scales for these positions.

Plans for systematic promotion. Specific plans for systematic promotional arrangements are almost as numerous as are the firms having such plans. They vary in detail rather than principle however, for there are many similarities in all plans. Most of them represent adaptations of two older, well-established arrangements. One of these, usually credited to the Gilbreths, is called the "three position plan." It involves an arrangement in which each position is related to one from which workers are promoted and to another to which promotions are made. There are three levels of attainment for each position, that of the student, that of the instructor, and that of the actual worker

at that task. Each employee passes through three stages on each job. He begins it as a student. He achieves the status of a journeyman, or full-fledged worker, after which he may be called upon, when an opportunity appears, to become an instructor. From the point of view of the worker, he looks always at three positions, the one he has most recently left, the one he occupies, and the one toward which he is headed. While the plan is not widely used in the exact form in which its originators described it,⁴ it is highly suggestive of modifications that more closely fit the requirements of individual industries and business concerns.

The other of the two best known plans is what is known as the "multiple chain promotion plan." It derives that name from the fact that it provides for a systematic linking of each position to several others from which promotions are made and to still others to which incumbents may be promoted. Obviously, its chief distinction is that it provides for greater flexibility than is possible under the three position plan. It permits multiple promotional opportunities through clearly defined avenues of approach to and exit from each position in the organization. Each such avenue is prearranged, and all are clearly indicated in the general chart of the whole systematic promotional plan. Moreover, each job may be described to its incumbent in terms of a number of avenues leading toward several superior positions.

What might be described as a third standardized system of promotions is the recognition of seniority as a basis for advancement. In such arrangements, the eldest incumbent in each position is given the preference whenever an opportunity for advancement appears. The system is always coupled with some restrictions upon the types of employees eligible for promotion into each higher position and is well illustrated by the procedure followed on most railroads in the United States. It has been a long-established feature,

⁴See, Gilbreth, Frank B. and Lillian M., "The Three Position Plan of Promotion," *Annals of the American Academy of Political and Social Science*, May, 1916, No. 65, pp. 289-296.

also, of certain phases of civil service in this country, and it is enforced, with exceptions, in the peace-time military and naval services of the nation.

The seniority system, although much criticized and properly ridiculed, has certain advantages and merits. The fact that an employee has been satisfactory throughout an extended period of service is in itself some evidence of value, since most highly unsatisfactory workers will be weeded out in such long service. Seniority unquestionably reduces labor turnover. Furthermore, such qualities as dependability and persistence may be effectively evaluated, and the long service required permits workers to accumulate information with respect to the business as a whole that may be desirable in some fields. In general, the system encourages a feeling of security of tenure on the part of the employee that has shown desirable reflections in morale and loyalty.

On the other hand, the system has many obvious deficiencies and should seldom if ever be applied to all phases of a business. It places a tremendous responsibility upon the preliminary selective program, since tenure is long and turnover is reduced. Many good employees are unable or unwilling to accept the necessary retardation in promotions that usually accompanies the system, with the result that they are driven out of the service. The system generally over-values experience, as far as most positions are concerned. The maximum value of experience for all types of minor positions is probably acquired in a few years, and additional time on that job is largely wasted. The system has repeatedly broken down under unusual strain. Railroads, as well as both the army and the navy, were forced to discard it in war time.

Under the circumstances, management should probably encourage the development of a system of seniority in a very limited range of positions, if at all, and the system should always be accompanied by reservations permitting exceptions whenever they are necessary or desirable.

Limitations on promotional provisions. The reality of definite limitations on the number that can be promoted in a given period in any modern industrial organization is a condition that cannot be ignored. There are inevitable blind alley positions, so called because they prepare for no advancement. Moreover, in the nature of any industrial or commercial organization, the ratio of superior executive and directive positions to the number of less important, operative jobs is necessarily small, and management cannot effect any great changes in this condition.⁵ Other means of stimulating and maintaining the interest of employees and their morale must, therefore, be utilized, in addition to promotion. For certain cases, it may frequently be desirable to make recommendations for promotion outside the organization, both as a means of giving employees deserved recognition and opportunity and of demonstrating to all employees management's interest in their personal welfare.

To some extent, the necessity for numerous promotions, in excess of those for which the organization can readily provide, may be avoided by a judicious selection in which effort is made to secure considerable numbers of workers of the type who do not desire any extensive promotion. There are many such workers, and, for certain types of work, they are entirely satisfactory. Moreover, it is not impossible to identify them in the selective process. Many firms distinguish carefully, in their selection programs, between those whom they are hiring for positions leading directly into lines of extensive promotion and those who are regarded as likely to remain relatively permanent and stationary in original appointments.

The two major limitations affecting any systematic promotion plan are thus the restricted number of advanced positions and the lack of desire for advancement that characterizes certain types of personnel. There are, however, other minor limitations. Established precedent and tradi-

⁵Florence, P. S., *The Logic of Industrial Organization*. London: Kegan Paul, Trench, Trubner & Co. 1933.

tion frequently make it difficult to open logical lines of advancement or to close those for which no genuine justification can be established. Short-sighted budget control may force employees to seek promotion outside the organization in spite of obvious future needs for the types of personalities and abilities thus lost. Many employers cannot see that a given candidate for promotion is likely to be worth as much to them as to their competitors, with the result that numerous shrewd managements make a regular practice of "stealing" the fully trained recruits after they have taken advantage of excellent training and experimental provisions of other concerns. In some instances, seniority systems effectively limit all efforts at provisions for any other inclusive promotional system.

Types of transfers. There are two principal types of transfers. In what is generally the most frequent, employment is reduced in one department, because of necessary restriction of production there, and employees are transferred to other departments, where their services can be used. Such shifts are described as "production" transfers. The other major type, generally described rather vaguely as "personnel" transfers, represents shifts made to meet the needs of workers rather than those of management, as is the case in production transfers. Personnel transfers are sometimes further distinguished as intra-departmental and inter-departmental. They may arise from a wide variety of causes, of which the most common is probably faulty placement, in which workers have been put to work at jobs unsuited to their abilities or their likes, although many other types of personnel difficulties may result in such transfers. In many cases, individuals may have changed their interests since their original placement. They may have broadened and developed so that they are qualified for a quite different position and require a transfer for that reason.

In other cases, personal relationships may make such a shift necessary. Employees may not get along well with

fellow workers or with foremen, so that transfer is necessary to solve such conflicts. In recent years, increasing numbers of situations of this sort have arisen as a result of the program of organizing industrial unions undertaken on a broad scale in 1936. Shops and divisions have become divided among themselves, and personal animosities have resulted. Transfers in such circumstances may be necessary to protect employees as well as to reduce strife.

One of the common causes of transfers is the physical condition of the worker. He may have reached an age where such a shift is necessary, or he may have developed physical characteristics that require a transfer to other types of work or different working conditions.⁶

In recent years, increasing attention has been given to the use of transfers to maintain employee interest and overcome monotony. With increasing division of labor and specialization, many jobs have attained a simplicity that may become highly monotonous and, for that reason, objectionable to certain types of workers. One means of allaying such dissatisfaction is the frequent use of transfers.

Systematic transfer. No such detailed plans as were suggested as desirable for promotions can be made for transfers, but there is a place for certain definite provisions with respect to the latter. Few managements have formulated and established specific transfer plans, but there have been steps in that direction, and they have shown genuine promise of value. Their purpose is to remove transfers from the comparatively irregular and unpredictable position they generally occupy and to define the conditions under which employees may expect to be asked to transfer or to have their requests for transfer approved. Managerial policy with respect to transfers in the past has generally not been carefully explained, and the conditions under which trans-

⁶See, Meine, Franklin J., "Transfer for Factory Production Employees," *Personnel Journal*, February, 1928, Vol. 6, No. 5, pp. 367-378; Bengt, Eugene J., *Cutting Clerical Costs*, pp. 272-275, New York: McGraw-Hill Book Company, Inc., 1931.

fers are or are not to be granted have frequently been a matter of speculation among employees. Sometimes, transfers are engineered almost entirely by department heads, and some covet and secure reputations for getting their favorites into desirable and out of less desirable locations. A systematic plan places all transfers under control of one executive or office, clearly indicates the conditions under which requests for transfers will be favorably regarded, and standardizes transfer policy and procedure.

Analysis of promotions and transfers. A first step in achieving any satisfactory plan with respect to promotions and transfers is the discovery of major features of existing practice. The first question to be asked is, what are the considerations and circumstances that feature the present arrangements? How, when, where, and why are promotions and transfers now made? Who dictates them, plans them, puts them into effect? An essential preliminary foundation for a systematic plan of promotion or transfer consists, therefore, of the analysis of current practices and their effects.

With respect to promotions, the essential features to be discovered, aside from those of managerial policies and structure, are the proportions and number of promotions among employees, the sources of those who are promoted, and the types of employees who secure promotions, these types being defined in terms of experience, ratings, performance on the job, entrance tests, and previous evidences of ability, such as school grades and participation in activities. Such investigation may not only disclose weaknesses in the promotional practices in use, but it may also indicate types, sources, and means of identifying individuals who seem particularly suited to promotion. It lays a basis for establishment of a well-founded, intelligent promotional program.⁷

Similar analysis may be applied to current and past ex-

⁷See, *Personnel Research in Department Stores*, Research Bureau for Retail Training, University of Pittsburgh. Lancaster, Pa.: Lancaster Press, 1927.

perience with transfers. Their numbers and proportions may be noted and compared, as may seasonal periods. Those who are transferred may be classified as to the reasons for transfer and as to their sources. Note may be made of peculiar types that appear prominently among those transferred, and transferees may, to that end, be divided into age groups or segregated into classes based on length of service, performance records, and ratings. By all such means, effort is made to discover what types of workers are transferred and why transfers are made. At the same time, it may be worth while to institute a follow-up of transfers to secure reliable information as to the success of these shifts.

Many of these conditions will have to be compared in terms of aggregates. Some of these comparisons may be made by means of averages. Mean or median measures of performance, ratings, ages, years of service, or other features of transferees may be compared with similar conditions characterizing the bulk of the working force. In the same way, averages of ratings, test scores, performance records, and other measures of those who are promoted may be compared with similar characteristics of those who did not receive such recognition. Where so many characteristics are to be evaluated, it is convenient to be able to state their relationships quantitatively, as in correlation. Thus, for instance, the relationship of ratings and promotions might be stated quantitatively for comparison with similar measurements of the relationship between promotion and length of service, or age, or years of schooling. Without such measures, it is difficult to compare these interrelationships, to balance one against another, and to determine which of them may be regarded as sufficiently important to justify further consideration and investigation.

Bi-serial correlation. In other connections, similar problems have been solved by use of coefficients of correlation, and similar usage suggests itself here. But these coefficients are, in their common form, usable only when both variables may be stated in quantitative form, that is, when varying

degrees of each are available and measurable. In the case at hand, and in several other aspects of personnel analysis, one of the variables is not quantitatively measurable, but is rather evidently present or not present. Thus, in this instance, while some measure of the number of promotions gained by an individual per year might be discovered and utilized, in many cases the definitive condition is the occurrence or non-occurrence of a promotion or transfer. If it is desired, for instance, to measure the observable relationship between education and promotions in a given period, the data to be analyzed might appear as shown in Table IX.

TABLE IX
COMPARISON OF EDUCATION AND PROMOTION

Data: Assumed for purposes of illustration.

Years of Education	Number of Employees	
	Promoted	Not Promoted
8	10	90
10	20	90
12	30	70
14	40	50

While the usual procedures of correlation are not conveniently applicable to this sort of problem, a type frequently encountered throughout the whole range of personnel analysis, there are two comparable devices which may be effectively used and whose results may be evaluated by reference to the charts of significance in Appendices G and H, just as are the usual coefficients of correlation. These devices are known as bi-serial r and bi-serial η , and their procedures are illustrated in Examples 24 and 25.

Each of these devices is dependent upon the known characteristics of the normal curve for its effectiveness, and each requires reference to tables defining the uniform characteristics of normal distributions, such as those included in Appendix E and Appendix F. In each case, the total frequencies involved (f) include a major portion (symbol

EXAMPLE 24
MEASUREMENT OF CORRELATION BY BI-SERIAL r^s

Data: See Table IX.

Years of Education Y	Promotional Experience			f_1Y	fY	fY^2
	Promoted f_1	Not Promoted f_2	Total f			
8	10	90	100	80	800	6400
10	20	90	110	200	1100	11000
12	30	70	100	360	1200	14400
14	40	50	90	560	1260	17640
Totals	100	300	400 = n	1200	4360 = ΣY	49440 = ΣY^2
Means				12 = M_1	10.90 = M_2	
Proportions	.25 = q	.75 = p	1.00			

Calculation of standard deviation:

$$\Sigma y^2 = \Sigma Y^2 - \frac{(\Sigma Y)^2}{n} = 49440 - \frac{19009600}{400} = 49440 - 47524 = 1916$$

$$\sigma_y = \sqrt{\frac{\Sigma y^2}{n}} = \sqrt{\frac{1916}{400}} = \sqrt{4.79} = 2.1886$$

Measurement of r_{Mu} :

When $q = .25$, $s = .3178$ (see Appendix F).

$$r_{Mu} = \frac{(M_1 - M_2)q}{s\sigma_y} = \frac{(12 - 10.9) .25}{(.3178)(2.1886)} = \frac{.275}{.6956} = .3955$$

Significance:

Least highly significant value (see Appendix H) is 0.12.

^sThe procedure finds the standard deviation by the usual method. Then it discovers the value of z for the given value of q . This result may be obtained directly from Appendix F. If tables of q and z are not available, reference may be made to the more common tables of a and s , since $a = (1 - 2q)/2$.

EXAMPLE 25

MEASUREMENT OF CORRELATION BY BI-SERIAL η^2

Data: See Table IX.

Years of Education <i>Y</i>	Promotional Experience			<i>T</i> ($f_2 + f$)	<i>A</i> ($T - .50$)	<i>z</i> or z/σ (from table)	z^2	fx^2
	Promoted f_1	Not Promoted f_2	Total <i>f</i>					
8	10	90	100	.90	.4000	1.2815	1.6424	164.2370
10	20	90	110	.818	.3182	0.9085	0.8254	0.7973
12	30	70	100	.70	.2000	0.5244	0.2750	27.5010
14	40	50	90	.556	.0556	0.1398	0.0196	1.7595
	100	300	400	.75	.25	.68	0.4550 = B^2	284.2948 = Σx^2

$$A^2 = \frac{\Sigma x^2}{n} = \frac{284.2948}{400} = .7107$$

$$B^2 \text{ (from column 8)} = .4550$$

$$\eta^2 = \frac{(A^2 - B^2)}{1 + A^2} = \frac{(.7107 - .4550)}{1 + .7107} = \frac{.2557}{1.7107} = .1495$$

$$\eta = \sqrt{.1495} = .3867$$

Significance:

Least highly significant value (see Appendix H) = 0.16

²The only question that is likely to arise is that concerning the transition from the column *A* to that of *z*. The value of *z* must be read from a table of ordinates and areas of the normal curve, in which *A* represents areas and *z* represents ordinates (frequently designated as *z/σ*). Such a table is included in Appendix E.

p) and a smaller segment or *tail* (symbol q). The method of bi-serial r assumes that the quantitatively measured variable is continuous, that the other variable is normally distributed, that the entire sample is included in the analysis (not just the worst and the best or the most and the least), and that a linear regression is appropriate. The method of bi-serial η requires fewer assumptions, although it is necessary that the two-fold variable be normally distributed. Detailed procedure will be apparent from the examples and their footnotes.

The measures thus obtained may be evaluated to discover whether or not the relationships are statistically significant by reference to the charts in Appendices G and H. The curve, $V = 2$, should be used for bi-serial r , while that representing the number of classes in the quantitatively measured variable may be used for bi-serial η . The wide usefulness of these measures for various types of personnel data will be suggested by the exercises at the close of this and subsequent chapters.

Exercises and Problems

1. Distinguish three types of systematic promotions.
2. What analysis of promotions and transfers is likely to be most effective?
3. Report upon one of the articles or studies mentioned in footnotes in this chapter.
4. Apply the analytical methods of bi-serial r and bi-serial η to the following comparison of educational accomplishment and promotions, and discover the least highly significant value.

Years of Education	Promotional Status	
	Promoted	Not Promoted
8	0	25
10	10	90
12	25	0

5. Use the method of bi-serial r to measure the possible relationship between training and average weekly sales as shown by the data tabulated below, and discover the least highly significant value.

Sales in \$100	Number of Salesmen	
	Trained	Untrained
1-3	10	300
3-5	20	500
5-7	45	60
7-9	25	40

Promotion and Transfer

6. Measure the same relationship by means of bi-serial η .
 7. Measure the possible relationship between length of service and promotions displayed in the following data, and discover the least highly significant value. Use the method of bi-serial r .

Length of Service Years	Promotional Status	
	Promoted	Not Promoted
0	1	20
1	3	30
2	6	40
3	5	60
4	15	90
5	20	110

8. Measure the same relationship by means of bi-serial η .
 9. Measure the possible relationship between transfers and ratings indicated by the data tabulated below. Secure measures of bi-serial r , bi-serial η , and the least highly significant value.

Ratings	Number of Employees	
	Transferred	Not Transferred
70 to 75	140	220
75 to 80	130	260
80 to 85	100	420
85 to 90	70	900
90 to 95	20	1320
95 to 100	20	1680

Collateral Reading

- Baridon, Felix E., and Loomis, Earl H., *Personnel Problems*, Chap. V. New York: McGraw-Hill Book Company, Inc., 1931.
 Cowdrick, Edward S., *Manpower In Industry*, Chaps. V, X, XVIII. New York: Henry Holt & Company, Inc., 1924.
 Davis, Ralph Currier, *The Principles of Factory Organization and Management*, pp. 345-350. New York: Harper & Brothers, 1929.
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 Hackett, J. D., *Labor Management*, Chap. XIV. New York: D. Appleton-Century Company, Inc., 1929.
 Hoopingarner, Dwight Lowell, *Labor Relations In Industry*, Chap. XXIV. New York: McGraw-Hill Book Company, Inc., 1925.
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 Person, H. S., editor, *Scientific Management in American Industry*. Chap. XVII. New York: Harper & Brothers, 1929.
 Scott, Walter Dill, Clothier, Robert C., and Mathewson, Stanley B., *Personnel Management*, second edition, Chaps. X, XIX. New York: McGraw-Hill Book Company, Inc., 1923.

- Shefferman, Nathan W., *Employment Methods*, Chaps. VII, XVII, XXIV. New York: Ronald Press Company, 1920.
- Shepard, George Hugh, *Elements of Industrial Engineering*, Chap. XVII. Boston: Ginn and Company, 1928.
- Tead, Ordway, and Metcalf, H. C., *Personnel Administration*, third edition, Chap. XV. New York: McGraw-Hill Book Company, Inc., 1933.
- Walters, J. E., *Applied Personnel Administration*, Chap. VIII. New York: John Wiley & Sons, Inc., 1931.
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CHAPTER XVI

Industrial Health

NOT all phases of industrial health by any means are subject to control or become a matter of concern to those whose responsibilities include personnel policies. Physical examinations may, in many cases, be administered by a specialized medical department, and hospital and nursing facilities may be provided and maintained quite apart from any centralized personnel administration. On the other hand, however, there are certain aspects of workers' health that inevitably involve personnel policies, of which the most important are injuries resulting from industrial accidents, together with occupational disease and ill health. Both are closely related to working conditions, and the latter must be an ever-present concern of those charged with responsibility for personnel policies.

Health hazards in industry. Many types of employment in modern industry and business involve genuine hazards to health. That condition is clearly disclosed in comparisons of life expectancies for industrial employees and non-workers. At age 20, for instance, the normal expectancy of life for non-industrial workers is approximately 47 years, that for industrial workers is 42 years. Numerous studies,¹ have shown that working classes are subject to more common

¹See, Britten, Rollo H., "Occupational Mortality as Indicated in Life Insurance Records for the Years 1915-1926," *Public Health Reports*, May 30, 1930, Vol. 45, No. 22, pp. 1250-1259; Dublin, Louis I., "The Mortality Trend in the Industrial Population," *American Journal of Public Health*, May, 1929, Vol. 19, No. 5, pp. 475-481; Newman, Bernard J., "Work Environment as a Factor in the General Health of Workers," *American Journal of Public Health*, December, 1931, Vol. 21, No. 2, pp. 1354-1359; Sydenstricker, Edgar, and Britten, Rollo H., "Physical Impairment and Occupational Class," *Public Health Reports*, August 22, 1930, Vol. 45, No. 34, pp. 1927-1962.

physical impairments, especially those of eyes, ears, teeth, and heart than the non-industrial population; and, while these conditions can not by any means be charged entirely to participation in industry, they are in part attributable to that condition. Moreover, the fact that some 7 per cent of all permanent separations from payrolls are caused by ill health argues in the same direction.

Industrial health hazards are of two major types. In part, they are attributable to industrial accidents. Another group of hazards are reflections of what are generally described as occupational diseases. Each is given more detailed consideration in subsequent paragraphs.

Industrial accidents. The number of industrial accidents for individual industries or for industry as a whole does not have much meaning, since such accidents vary from simple abrasions, scratches, and minor cuts to fatalities. As will be indicated in a subsequent section, it is necessary to utilize a somewhat more complicated accident accounting system. Similarly, no estimate can accurately evaluate the economic costs of industrial accidents, but it can be said that the reduction of accidents offers a genuine opportunity for savings to management. That this is true may be seen from a brief consideration of the incidence of losses arising from such accidents.²

Number and costs of accidents. While many estimates of the number of industrial accidents are made, most of them indicate approximately 20,000 fatalities annually in the United States. Such a number roughly represents 1 loss of life for each 9 minutes of working time, and to this number of fatalities must be added a non-fatal injury for each 4 seconds of working time. The situation may be approached from another angle by indicating that each employee averages some 5 injuries per year, while 1 of each 6 workers has 1 lost-time accident per year, and 1 of each of 780 exposed workers is killed each year.

²See, Heinrich, H. W., "Cost of Industrial Accidents to State, Employer, and Workman," *Monthly Labor Review*, November, 1930, Vol. 31, No. 5, pp. 72-78.

All these data are of highly questionable accuracy because there is no uniform and systematic reporting of accidents in this country. In general, reports to state authorities are required only when accidents occasion loss of time in excess of the day or shift, while in some fourteen states only compensable accidents are reportable. The latter include only accidents occasioning a loss of time in excess of the prescribed waiting period, which may extend through several days or a week. Moreover, many accidents fall outside the occupations covered by compensation laws or among firms too small to be included, so that it has been estimated, for instance, that only 34 per cent of all employees are included in employments for which reports are made in Alabama, only some 55 per cent in Illinois, 56 per cent in New Hampshire, and somewhat larger proportions in other jurisdictions.

Attempts to place a financial value on the losses occasioned by accidents are necessarily similarly vague. The federal Bureau of Labor Statistics estimates that industrial accidents occasion a loss of 296 million working days each year, which, it is calculated, represents some \$27 million dollars in wages. To that, 312 million dollars for employers' payments for medical attention and compensation must be added. Compensation costs total some 240 million dollars annually.

There are, however, numerous indirect costs not included in any such accounting. There is the inevitable cost of interferences in production occasioned by the event of the accident, of failure to secure an equally efficient substitute worker, and the loss of time of foremen, fellow workers, and others whose routine is disturbed. In many cases, machinery and raw materials may be injured, and losses may be sustained because of inability to fill orders on time. These and other indirect costs cannot be accurately evaluated.

It is frequently assumed that accidents merely result in higher production costs, which are then passed on to the consumer. Such reasoning most commonly assumes that this effect is occasioned by a tendency for wage rates to reflect ac-

cident hazards, that is, to show a reluctance on the part of workers to enter hazardous occupations, so that it is necessary to pay premium wages in order to secure such workers. There is, however, no evidence to indicate the reality of this condition, and some of the most hazardous occupations show lowest hourly, weekly, and annual earnings. It must be concluded, therefore, that no such simple shifting of the burden of accident costs takes place.

Many employers are convinced that they actually bear the total burden of accident costs. They pay the judgments secured by injured workmen who sue in the courts, they provide compensation benefits awarded workers under existing compensation laws, or they pay insurance premiums where-by insurance companies are employed to assume these risks.

While it is unquestionably true that actual payments are made in the form of judgments or compensation by employers or their insurance agencies, it is generally agreed by careful students that the major portion of the burden is not borne by employers but is shifted on to employees, generally without the knowledge of the latter. What happens is that the costs of compensation tend to be assessed against labor costs as a premium that has to be paid for the services of labor. Since these services are not definitely increased by the payment of this premium, the net value of those services is reduced. In the long run, such a reduction is inevitably reflected in wages. While a detailed analysis is scarcely appropriate for consideration here,³ the implications are highly important. They indicate that the wages of each class of labor are reduced on the market in an amount approximating current costs of compensating for industrial accidents plus the costs of administering such compensation. Accordingly, the alert manager who reduces accidents may secure the advantages of this saving and, at the same time, keep actual accident costs below current levels. The premium

³ See, for detailed consideration, Yoder, Dale, *Labor Economics and Labor Problems*, pp. 325-326. New York: McGraw-Hill Book Company, Inc., 1933.

charged against labor will be determined, as to amount, by the accident experience of the occupation as a whole, while actual compensation costs in the individual firm may be much less if accidents are reduced.

Legislation and accidents. Legislation is in no small measure responsible for present-day managerial attitudes toward industrial accidents. The development of modern laws has made the opportunity for management to save by reducing accidents much more obvious and has thereby stimulated programs designed to effect that objective.

In the early years of the factory system and the business structure that accompanies it, there were no statutory provisions as to responsibility for the costs of industrial accidents. Dependence was placed on common-law rules of equity. As these rules developed, they came to emphasize the principle that accidents were of two types, the one made up of accidents for which no one could reasonably be held responsible, that is, pure accidents, and the other composed of those for which some one was directly chargeable. For the first type, the courts could see no solution other than that those who were so unfortunate as to suffer the injury should bear its burden, since no one else could properly be held responsible for it. In dealing with the second type, however, the courts indicated that whoever was responsible for the accident should reasonably be expected to bear its burden, whether the responsible person were an employer, a fellow worker, or the injured employee.

In attempting to allocate responsibility for accidents, the common law developed certain rules defining employers' obligations and certain others limiting those obligations. Thus employers were required to provide a reasonably safe place to work, to conduct the business in a safe manner, and to employ only competent employees. Having done so, they were allowed certain defences against claims for damages sought by injured employees. Thus they might claim that the risk was inherent in the work and unavoidable and hence accepted by the worker when he accepted employ-

ment, the so-called *assumption of risk* doctrine. Or they might insist that the employee, by his own carelessness or neglect, was responsible, the so-called *contributory negligence rule*. Again, they might claim that the accident was occasioned by action of a competent fellow worker, for which, therefore, they could not be held responsible, under what became known as the *fellow-servant rule*.

In this country, popular emphasis was early placed upon a "government of laws, not of men," so it was natural that these common-law rules of procedure should be incorporated in statute law. So incorporated, and with only a few additional features, they formed the employers' liability laws, enacted by all states and only recently, in many cases, superseded by workmen's compensation laws.

Both workers and employers found many unsatisfactory aspects of the procedure under employers' liability laws. No machinery other than the courts was provided for adjudicating claims of employees against employers, so that a large number of such cases came into court. Employers were constantly harassed with the possibility that a judgment so large as to cripple their business operations might be secured by an injured employee. Meanwhile, many employees found court procedure too expensive and either settled out of court upon bases of questionable equity or else secured no recompense whatever for their injuries. In many cases, injured workmen, unable to carry their claims through the courts or unsuccessful in court action, were left without any means of support and became public charges.

At the same time, the whole system resulted in a highly inefficient distribution of such funds as employers paid for the purpose of meeting claims. They customarily employed insurance companies to assume their risks under the laws. These companies, in turn, hired attorneys to defeat suits for damages. At the same time, ambulance-chasing lawyers swooped down on accident victims, secured their authorization to sue, and took such cases on a contingent basis. The net result was that most of the funds paid out by employers,

instead of going to injured workmen, went to courts, insurance companies, and lawyers. One study of a large number of cases indicates that only 28 cents out of each dollar paid by employers reached injured employees. The remainder was dissipated in the complicated liability procedure.⁴

Workmen's compensation laws. As a result of general dissatisfaction with these conditions, a new type of legislation began to appear in this country at about the turn of the century. Several European nations had tried this type of law in the 1890's, and the first workmen's compensation law in this country was enacted in 1902 by the state of Maryland. It was held unconstitutional, and not until 1908, when an act applying to federal employees was upheld, was effective legislation begun. The first successful state law was that of Washington, passed in 1911. Since that time, 45 additional states have enacted such laws, Arkansas and Mississippi being the only states that have not done so.

Newer compensation laws are radically different from the earlier employer liability legislation. They proceed upon quite different assumptions. No attempt is made to allocate responsibility and to distribute the burden of accidents on the basis of such allocations. Rather, the legislation assumes that no one intentionally causes accidents, and that what is desirable is a systematic method of easing the burden that necessarily falls upon the injured worker. Accordingly, all serious injuries are made compensable, and employers are charged with the responsibility for compensation without reference to their part in occasioning accidents. Most of the acts have assumed that the costs of such compensation are then passed on by employers to consumers, although that is highly questionable. Rather, it appears likely that the costs of compensation in competitive industry represent an assessment against wages.

⁴ See, Beyer, Otto S., and Fitch, E. M., "Cost of Accidents to Railroad Employees," *Monthly Labor Review*, September, 1935, pp. 552-557; Beyer, Otto S., "Cost of Occupational Accidents in the Railroad Industry," *American Labor Legislation Review*, December, 1935, Vol. XXV, No. 4, p. 178f.

Benefits under the compensation laws are standardized, and administration seeks to avoid the necessity for court action as far as possible. Ultimate recourse to the courts is permitted under all of the acts, but specific administrative machinery is provided, so that, in the vast majority of cases, complicated legal procedure is unnecessary. For the most part, concerns employ insurance companies to assume their risks under the acts, although several laws allow them to post a bond guaranteeing payment of compensation costs in lieu of such insurance. A few states require employers to insure in what are known as exclusive state funds, which are, in effect, state-managed insurance companies. The advantages of such public provisions are widely debated at the present time.⁹

Compensation is prescribed, as to amount, as a proportion of weekly wages, with a fixed minimum and maximum. The most common provision allows 60 per cent of weekly wages (27 states). The maximum amount to be drawn is now \$18 per week in 29 states, and 13 states fix the minimum at \$7 or more. The others allow lower payments. The period for which compensation may be drawn is determined by the disability incurred, and 17 states now provide compensation for life in cases of permanent disability.

So long as most of the states depended upon employers' liability laws, many managements gave little attention to the possibility of reducing either the frequency or the severity of accidents. Rather, they sought to avoid any serious judgment by employing insurance companies and attorneys to protect them in the courts. When workmen's compensation procedure was substituted for the earlier arrangements, so that it became obvious to almost all management that it

⁹See, Andrews, Elmer F., "Exclusive State Fund Needed for Compensation Insurance," *American Labor Legislation Review*, December, 1934, Vol. 24, No. 4, pp. 165-170; Michelbacher, G. F., *Workmen's Compensation Insurance*, New York, McGraw-Hill Book Company, Inc., 1925; Leslie, William, "Workmen's Compensation Insurance," *Annals of the American Academy*, May, 1932, No. 161, pp. 98-104; Gagliardo, D., *Labor Legislation for Kansas Coal Mines*, Lawrence, University of Kansas Studies in Business, No. 17, 1936.

could not avoid payments to injured employees, the situation changed, and interest in safety programs was greatly increased. Numerous large corporations began to experiment in accident prevention, and the movement was accelerated by the announcement, in 1907, of highly satisfactory results from a plan put into effect by the United States Steel Corporation. Other steel companies were immediately interested in possibilities of accident prevention in this hazardous industry, and the subject was made the subject of major discussion at the 1911 meeting of the Iron and Steel Engineers' Association. In the following year, members of that association began formation of the National Safety Council, an organization that has led the safety movement since it was officially instituted in 1913. The organization is a non-profit association having some five thousand members. It publishes numerous safety suggestions, pamphlets, and placards, and compiles extensive statistics of interest to its members and to the public.

Numerous other associations and agencies have also given increasing attention to industrial accidents. State agencies, charged with administration of compensation laws, naturally became interested in prevention, and many states have given them authority to investigate accidents and suggest or require changes in working conditions. In 1911, the New York State Department of Labor began development of its American Museum of Safety, in which various safety measures and devices are exhibited as means of encouraging safer industrial practices. Several states have since begun the practice of holding annual safety conferences, at which employers are instructed in safety devices and measures.

Management's interest in safety has been further stimulated by the development of rating procedure by means of which insurance rates for protection against compensation claims are determined. The determination of such rates makes use of what is generally referred to as *merit rating*, in that it seeks to take account of meritorious practices employed by management to reduce accidents. In early

practice, great dependence was placed upon *schedule merit rating*, in which investigators sought, by careful inspection, to list the various processes and machines involved and to estimate the accident risk presented by their combination with non-mechanical conditions, at the same time that allowance or credit was given for safety devices. This procedure was not generally successful, and it has been completely discontinued in many states in favor of what is known as *experience merit rating*. The latter method emphasizes, as the basis of insurance rates, the employer's accident record or experience. Naturally, with insurance rates directly dependent upon previous experience, management is highly concerned to see that accidents shall be as infrequent as possible, and increasing dependence upon experience rating has directly stimulated safety programs.

Causes of accidents. Numerous studies undertaken by research agencies, private and public, have sought to evaluate and describe the causes of industrial accidents. No entirely satisfactory classification of causes is available, but those which are most commonly mentioned include fatigue, speeded production, inadequate experience, faulty instruction, lack of attention, mechanical hazards, physical unfitness of workers, mental unfitness, and unsatisfactory working conditions.⁶

This summary clearly indicates what practically every study has shown, namely, that human factors are most important in causing accidents. Almost all accidents are attributable to complex causes, but human factors are of major importance throughout. Individual differences, the numerous variations of human characteristics, appear, more than anything else, to explain accidents, and their study offers greatest promise of reducing accidents.

All sorts of human traits are related to accident occur-

⁶See, Farmer, Eric, "Recent Research into the Causes of Industrial Accidents," *Journal of Industrial Hygiene*, February, 1933, Vol. 14, No. 2, pp. 84-86; Dublin, Louis I., and Vane, Robert J., "Causes of Death by Occupation," United States Bureau of Labor Statistics, Bulletin No. 507, 1930.

rence, and both native and acquired features may be of importance. Thus, it appears clearly that new employees are more likely to have accidents than are older, experienced hands, a condition indicating that training and experience may be expected to reduce accidents. The attitudes of employees toward their work may be highly important with respect to accidents, as may be such individual characteristics as aestho-kinetic coördination, blood pressure, sex, reaction time, and numerous other individual differences. Vision, conditions of strain and fatigue, and a variety of others are likely to be involved in any comprehensive explanation of accidents.⁷

It has been repeatedly demonstrated that accidents do not just happen and that they do not strike all workers impartially. On the contrary, careful study of individual accident problems or those of particular firms will generally disclose the fact that, while large numbers of workers have almost no accidents, a much smaller number of workers account for a large portion of all accidents. In part, this situation is attributable to individual differences among employees, to the fact that certain workers exhibit what is generally described as "accident proneness," and, in part, to the fact that certain departments, divisions, and types of work offer much greater hazards than others. The personal differences among workers are striking, and the condition they create has sometimes been described in the statement that the curve of accidents is a *J*-shaped curve in which a small portion of employees is responsible for the larger share of all accidents. This curve, illustrated in Figure 30, clearly states one important phase of the problem of accident pre-

⁷Farmer, E., and Chambers, E. G., *A Study of Personal Qualities in Accident Proneness and Efficiency*, London, Fatigue Research Board, Report No. 55, August, 1929; Miles, G. H., "The Psychology of Accidents," *Journal of the National Institute of Industrial Psychology*, October, 1930, Vol. 5, No. 4, pp. 183-192; W. F. Hanna, "Detecting the Accident-Prone Operator," *Aera*, December, 1931, Vol. 22, No. 12, pp. 733-736; Chambers, E. G., "Personal Qualities in Accident Causation," *Journal of Industrial Hygiene*, June, 1930, Vol. 12, No. 6, pp. 223-232; Farmer, Eric, "Psychological Study of Accident Proneness," *Personnel Journal*, August, 1930, Vol. 9, No. 2, pp. 115-120.

vention, the discovery of accident sources in terms of persons and occupations and the institution of such changes as will make accidents less frequent.⁸

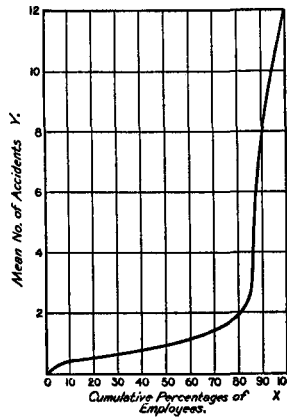


Fig. 30.—The "J" Curve of Accidents.

Preliminary steps in accident prevention. The purposes of accident prevention are obvious. It seeks to reduce accidents and their costs to management, employees, and the public by discovering causes, sources, and affected individuals. It assumes, of course, that a large proportion of all accidents are preventable, and that definite accident-producing situations can be recognized. In support of the first

⁸ See, Slocombe, Chas. S., "How to Cut Accident Costs," *Personnel Journal*, October, 1937, Vol. 16, No. 4, pp. 134-141; Farmer, E., and others, *Tests For Accident Proneness*, London, Fatigue Research Board, Report No. 68, 1933; Brakeman, E. E., and Slocombe, C. S., "A Review of Recent Experimental Results Relevant to the Study of Individual Accident Susceptibility," *Psychological Bulletin*, January, 1929, Vol. 26, No. 1, pp. 15-38; Stevens, Albert F., Jr., "Accidents of Older Workers: Relation of Age to Extent of Disability," *Rehabilitation Review*, April, 1930, Vol. 4, No. 4, pp. 91-98.

assumption, it may be said that most investigations have shown that approximately 90 per cent of all accidents are preventable, and the second is supported by the excellent achievements of numerous safety programs.

The basis of any safety program must be laid in a careful analysis of accident experience. It usually begins with the measurement of accidents. Since they involve two rather distinct features, their number or frequency and their severity, it is customary to calculate two separate rates, generally described as *frequency* and *severity* rates. Such rates, in order to be comparable from time to time and place to place, must take account of the exposure involved, for which reason they are related to the number of man-hours. Some calculations use the number of full-time workers as a base and define the latter as 1200 hour employees (forty weeks of 30 hours), while the International Institute compares the number of accidents on the basis of ten-hour days. In this country, standard procedure defines frequency rates as the number of lost-time accidents per million man-hours worked, while the severity rate is defined as the number of days lost per thousand man-hours. In formula form, these rates appear as,

$$\text{F.R.} = \frac{\text{Lost-time accidents}}{\text{Man-Hours} \div 1,000,000}$$
$$\text{S.R.} = \frac{\text{Days Lost}}{\text{Man-Hours} \div 1,000}$$

The use of lost time as a measure of severity has its advantages, but it was early apparent that the time lost in one plant on account of a given type of injury might vary considerably from that lost on account of a similar injury in another situation, so that an actual count of lost days would not permit satisfactory comparisons of accident hazards or experience. For this reason, the International Association of Industrial Accident Boards and Commissions has prepared a standard scale for evaluating various types of dis-

abilities. The scale provides specified weights for particular disabilities, of which the following are illustrative:

Death	6000 days
One hand	3000 days
One eye	1800 days
Thumb	600 days
Two fingers	750 days
Leg above knee	4500 days
Leg at or below knee	3000 days
Hearing, one ear	600 days

Partial losses are weighted as fractions of such values, and the uniform accounting thus facilitated has been found highly satisfactory, although it will be apparent that the small plant, if it charges the total loss of time of one or more serious accidents to a single year instead of spreading that loss over a longer period, may show wide fluctuations.

Accident statistics for individual plants may be readily compared with those of other units and with the industry as a whole. Several sources make such data available, including a number of federal bureaus as well as state departments of labor and industrial commissions. Federal agencies that compile such data include the Bureau of Labor Statistics (iron and steel and summaries); Children's Bureau and Women's Bureau of the Department of Labor; Bureau of Chemistry and Soils of the Department of Agriculture; Bureau of Air Commerce; Bureau of Navigation and Steamboat Inspection; Bureau of Mines (coal, metals, quarrying); Navy Department, Bureau of Yards and Docks; Public Health Service; and the Interstate Commerce Commission (railroads, busses, and trucks). State agencies most commonly charged with responsibility for maintaining such statistics include departments of labor, industrial commissions, workmen's compensation administrations, and bureaus of mines. In addition, the National Safety Council publishes annual summaries of accident experience for a wide range of industries; trade associations frequently keep

records of accidents, and numerous casualty insurance companies maintain records of their compensation experience in a variety of fields.⁹

Naturally, there is great difference in the hazards involved in individual industries. Some of them show high severity rates and low frequency rates (cement, laundering, and steel are in this group), others show just the reverse conditions (meat packing, foods), while still others are featured by high rates of both types (mining, construction, woodworking, and lumbering) or low rates of both types (printing and publishing, automobiles, and machinery).

Comparisons with other plants and industries should be supplemented by detailed analysis of accident experience within the organization. Such analysis may be approached from several different angles. One of the most common approaches is that which seeks to find out what kinds or types of workers have larger numbers of accidents. It may begin by comparing the experiences of individual workers and departments as to number and seriousness of accidents. Their average numbers of accidents may be readily compared. Careful calculations have been made measuring the likelihood or probability of accident incidence, which indicate, for example, that the average number of expected accidents (on the theory of equal risk) varies roughly with the proportions of employees having no accidents, as shown in Table X. Any department may be readily evaluated as to its accident experience by calculating the percentage of employees having no accidents and then comparing the average for the department as a whole with the theoretically expected average shown in the Table. If the actual average is appreciably higher, it is likely that a number of accident-prone individuals are affecting it.

In order to make such analysis most effective, it is desirable to secure extensive information with regard to the em-

⁹ See, "Industrial Accidents," *International Labour Review*, January, 1931, No. 23, pp. 87-110; *Handbook of Labor Statistics*, pp. 273-275, Washington, Government Printing Office, 1936.

TABLE X
THEORETICALLY EXPECTED MEAN NUMBERS OF ACCIDENTS

Number of Employees per Hundred Having No Accidents	Mean Number of Accidents per Person
85.0	.1625
80.0	.2231
75.0	.2877
70.0	.3567
65.0	.4308
60.0	.5108
55.0	.5978
50.0	.6931
45.0	.7985
40.0	.9163
35.0	1.0468
30.0	1.2040
27.5	1.2910
25.0	1.3863
22.5	1.4917
20.0	1.6094
17.5	1.7430
15.0	1.8971
12.5	2.0794
10.0	2.3026
9.0	2.4079
8.0	2.5257
7.0	2.6593
6.0	2.8134
5.0	2.9857
4.5	3.1011
4.0	3.2189
3.5	3.3524
3.0	3.5066
2.75	3.5936
2.50	3.6889

Source: Newbold, E. M., *A Contribution to the Study of the Human Factor in the Causation of Accidents*. London: Industrial Fatigue Research Board, Report No. 34, 1926.

ployee involved in each accident. Accident records should indicate the department and occupation of the worker, his sex, age, and length of service. Analysis may indicate that the proneness to accidents is reduced with additional years of service, and it will probably show also that although older workers have fewer accidents, they have more serious ones, when lost time is regarded as a measure of severity. Records should disclose the previous accident experience of the worker and causes of earlier accidents. They should show

any measurement of intelligence, proficiency, test scores, or recent ratings characterizing the employee and any outstanding facts disclosed by the physical examination or by psychological examinations. Language difficulties, wage rates, and any distinctive characteristics of the worker should be noted. It is generally desirable that the report indicate the extent of injuries and the marital status and number of the worker's dependents. Before the case is closed, all the facts with respect to the duration of the disability and the amount of compensation should be included in the record.

In addition to these facts with respect to the worker, the report should indicate the exact time of the accident in terms of hour, day, and week. The department involved and any unusual features of working conditions should be noted. The ascertained or immediate cause should be recorded, as should all conditions suspected of being related to the affair, such as unusual temperatures, humidity, drafts, ventilation, lighting conditions, and others.

Thus the whole safety campaign is rationally based on facts disclosed by careful analysis of personnel records and those describing individual accidents. If it is to be most effective, continued re-examination of these data is necessary to discover causes and sources of accidents and to suggest means of attack. Individual cases must be carefully analyzed and a variety of statistical approaches will suggest themselves as likely means of discovering and measuring the conditions associated with accidents.¹⁰ Comparisons of rates between departments, divisions, and sexes; correlations of accident rates with ages, length of service, marital status, number of dependents, rates of production, lengths of working day; evaluation of time, place, and other associated conditions—all these and other types of analysis are

¹⁰ See, Slocombe, C. S., "Accident Reduction Through Personnel Study," *Aera*, August, 1929, Vol. 20, No. 8, pp. 454-456; Heinrich, H. W., *Industrial Accident Prevention*, New York, McGraw-Hill Book Company, Inc., 1931.

essential foundations for a most successful campaign directed toward accident reductions.

Safety organization. The specific organization of the safety program must, of course, be adapted to the size and nature of the plant. In a small unit, it may require only one or more officials who devote part time to this activity, but it may require the specialized services of several persons and the coöperation of many more in a large organization. In general, the plan should be so organized as to indicate clearly management's serious interest in the work. Hence, some executives should participate. In addition, if the organization is extensive, committees of department heads, foremen, and employees may well be formed to further the work. In larger organizations, safety engineers may be employed, as may special safety inspectors.

However it may be organized, the individual or group that manages the safety program will face several major types of responsibilities. It will provide for some kind of inspection of mechanical facilities to assure that every possible safeguard in their operation is provided and to install whatever additional equipment of this sort may be required. It will find it advantageous to coöperate with state agencies interested in accident prevention. It will be responsible for making such analyses of accident experience as have been described in the preceding section of this chapter, and for utilizing the results of such studies to reduce accidents in the future. To that end, also, it will insist upon careful accident records and will presumably maintain a detailed accounting of the types, causes, costs, and all other aspects of accident experience. It may find it desirable to experiment with special tests to discover accident proneness among workers in certain departments.¹¹

Probably, however, greatest attention will necessarily be given to an educational campaign by means of which em-

¹¹ American Engineering Council, *Safety and Production*, New York: Harper & Brothers, 1928.

ployees are encouraged to do their part in accident prevention. That campaign may well make use of a variety of educational and propaganda facilities. The employees' handbook is a widely used medium, as are bulletin boards, slips in pay envelopes, and articles in the plant magazine. Provision of careful instruction for new employees is an essential feature of all safety campaigns. In many cases, contests in which departments or divisions are arrayed against each other have proved highly effective. Committee meetings, later expanded to bring all workers in a shop together for discussion of safety practices, may be valuable, and suggestion systems may be used to encourage widespread thinking on the subject. Some managements have found moving pictures an effective medium for communicating the essentials of the safety program to workers.¹² Numerous safety codes for individual industries have been developed as a direct outgrowth of governmental coöperation in safety campaigns, and standards, in terms of working conditions, have been established. Such steps have assisted greatly in reducing both the frequency and the severity of accidents.¹³

Value of safety programs. The positive values of safety programs are attested by the experience of numerous concerns in all types of business, and they are unquestionably reflected in the accident experience of American industry in recent years as shown by records maintained by several government bureaus and by such agencies as the National Safety Council. Both frequency and severity rates have been reduced, although the effects of such efforts are much

¹² See, Campbell, John, and Mahon, E. B., "Training Men in Safety," *Mining Congress Journal*, May, 1932, Vol. 18, No. 5, pp. 68-69; DeBlois, L. A., *Industrial Safety Organization for Executive and Engineer*, New York, McGraw-Hill Book Company, Inc., 1926; Williams, Sidney J., *Manual of Industrial Safety*, New York, McGraw-Hill Book Company, Inc., 1927; Marek, R. L., *Selecting and Training the Refinery Personnel to Prevent Accidents*, Washington, Government Printing Office, April, 1932.

¹³ See, Ainsworth, Cyril, "Safety Standards in Industry," *Monthly Labor Review*, November, 1930, Vol. 21, No. 5, pp. 80-85; *Safety Codes for the Prevention of Dust Explosions*, Washington, Bureau of Labor Statistics Bulletin No. 662, December, 1931.

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more noticeable in frequency than in severity rates. It is a comparison of these rates, as summarized by the Bureau of Labor Statistics for manufacturing industries and by the Occupational Safety Council for its members, is presented in Table XI. The data speak for themselves.

TABLE XI
RECENT CHANGES IN ACCIDENT RATES

Year	B.L.S., Manufacturing		N.S.C. Members (Index Numbers, 1926 = 100)	
	Frequency Rate	Severity Rate	Frequency Rate	Severity Rate
1926	24.16	2.62	100	100
1927	22.60	2.58		
1928	22.52	2.64		
1929	23.98	2.43		
1930	23.08	2.82	55.6	79.1
1931	18.85	2.59		
1932	19.55	2.86	38.5	64.7
1933	22.17	2.59	41.2	60.6
1934			43.2	63.4

For Bureau of Labor Statistics data, see *Handbook of Labor Statistics*, pp. 275-278, 1936 Edition.

Occupational disease. The second of the major hazards to the health of industrial workers is what is generally described as industrial or occupational disease. Its extent is unknown, for many health conditions now believed to have resulted from certain types of employment and working conditions have not been so regarded in the past, and few records of loss of time and disability attributable to them are available. The relationship between occupations and diseases associated with them is by no means completely defined, but it is known that certain occupations show unusual proportions of certain disabilities, and the general condition, in which industrial workers show distinctly higher proportions affected by specific diseases than the non-industrial population, is beyond question. It is known, for instance, that tuberculosis is two and one-half times as frequent among industrial as among non-industrial workers,

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st degenerative diseases are two to three times as fre-

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educational authorities in industry have long recognized the extensive interference with employment occasioned by ill health. Sickness, in the aggregate, occasions some eight times as much lost time for employees as do accidents. It causes the average worker to lose 2 to 3 per cent of his working time each year.

Popular attention to the health hazards of industry has been increasing in recent years. The spectacular aspects of these hazards have captivated the imaginations of many citizens. The slow, painful death of workers occupied in painting radium dials for watches, and the disability of employees who had been handling so-called "looney gas" received much newspaper comment. More recently, a public investigation of working conditions at Gauley Bridge in West Virginia concluded with the following declaration:

That the whole driving of the tunnel was begun, continued, and completed with grave and inhuman disregard of all consideration for the health, lives, and future of the employees.

That as a result many workmen became infected with silicosis; that many died of the disease and many not yet dead are doomed to die from the ravages of the disease as a result of their employment and the negligence of the employing contractor. That such negligence was either willful or the result of inexcusable and indefensible ignorance there can be no doubt in the face of the evidence presented to the committee.

The record presents a story of a condition that is hardly conceivable in a democratic government in the present century. It would be more representative of the middle ages. It is the story of a tragedy worthy of the pen of Victor Hugo—the story of men in the darkest days of the depression, with work hard to secure, driven by despair and the stark fear of hunger to work for a mere existence wage under almost intolerable conditions.

Naturally, since knowledge of industrial ill health is so restricted, no accurate estimate of its costs can be made, but it has been calculated that medical costs probably amount to half a billion dollars annually and wage losses total some four billion dollars.

¹⁴ Brundage, Dean K., "Disabling Illness among Industrial Employees in 1934 as Compared with Earlier Years," *Public Health Reports*, November, 1935, Vol. 50, No. 44, pp. 1527-1539.

Additional types of industrial ill health are constantly being recognized, so that new causes are appearing. It is not possible, therefore, to indicate any satisfactory classification of causes of industrial ill health. A few of the most important of such sources may, however, be noted. The Bureau of Labor Statistics has outlined, as most important, temperature conditions, air pressure, humidity, dust, light, motion or jar, infections, and poisons. From these conditions, in their various forms, most industrial ill health may be traced. Similarly, some idea of the wide range of health conditions involved may be gained from the fact that a study of industrial illness in British factories from 1910 to 1933 indicates, as the most common hazards, lead poisoning, mercury poisoning, arsenic poisoning, carbon bisulphide poisoning, aniline poisoning, chronic benzene poisoning, toxic jaundice, anthrax, epitheliomatous ulceration, and chrome ulceration.¹⁵

Analysis of health conditions. One fairly uniform approach in analysis of health conditions within industry involves measurement of frequency and severity rates for these conditions, in a manner somewhat similar to those used in the analysis of accidents. The frequency rate is defined as the number of cases of illness occasioning absences in excess of the day or shift per thousand employees, calculated on a monthly basis. It will be clear that there is no need to consider the number of hours per day in such calculations. The severity rate is defined as the number of days lost per thousand employees, also calculated on a monthly basis. In some cases, severity rates are also calculated by measuring the severity per case as the ratio of the total number of days lost to the total of cases.

Further analysis computes separate rates for the sexes, for different departments and occupations, for causes of illness, and for ages and wage classes. It may be worthwhile to compare rates for different weeks and months and for

¹⁵"Industrial Diseases and Poisoning in British Factories, 1933," *Monthly Labor Review*, December, 1934, Vol. 39, No. 6, pp. 1396-1400.

different days in the week. Analysis may seek to discover the duration of illnesses among different groups and types of workers. It may well compare illness experience with the facts disclosed by preliminary physical examinations, although some studies have indicated that physical defectives, contrary to much current opinion, do not show higher illness rates.¹⁶

Care of employee health. Numerous steps may be taken by management to reduce hazards of industrial disease. All should be founded upon a thorough understanding of conditions as they are. For industry as a whole, total absence rates should not generally exceed 4 per cent of working time, and illness should occasion not more than 2 per cent of total absences. Effective health programs may reduce these proportions appreciably in individual cases.

Such programs are not new; they began with provisions of medical facilities for workers. The oldest arrangement of this type is generally credited to the Lowell Textile Mills, although several other prominent concerns, including the John B. Stetson Company and the Crane Company, have long maintained such facilities. A movement directed toward the expansion of these provisions is clearly evident in the records of the Bureau of Labor Statistics. In 1916, the Bureau found that of 375 plants reporting, 110 had only first-aid facilities, 171 had resident physicians, and 181 employed trained nursing services. By 1926, when 430 plants reported, 34 of them had only first-aid provisions, while 311 had one or more physicians in residence, 532 employed trained nurses, and 573 had either a dispensary or an emergency hospital.¹⁷ A more recent survey would appear to

¹⁶Diets, J.W., "An Experiment with Vocationally Handicapped Workers," *Personnel Journal*, February, 1932, Vol. 10, No. 5, pp. 365-370; *Statistical Methods for Measuring Occupational Morbidity and Mortality*, Geneva, International Labor Office, 1930; Sullivan, Oscar M., "Making Wage Earners of the Physically Handicapped an Expanding Movement," *Occupational Therapy and Rehabilitation*, February, 1932, Vol. 11, No. 1, pp. 25-30.

¹⁷Lange, W. H., *Trends in Personnel Health Service*, American Management Association, General Management Series, No. 85, 1929.

indicate that such facilities were not maintained during the depression. A study undertaken by the United States Public Health Service in 1935 investigated 615 plants employing some 28,700 workers and found that only 17 per cent employed a part-time physician, while 34 per cent provided a nursing service. As would be expected, smaller plants did not generally have these facilities. Where less than 100 workers were employed, only 2 per cent of the plants had a safety director, 5 per cent had a first-aid room, 1.5 per cent had a part-time physician, and 0.2 per cent had a full-time nurse. In plants employing more than 100 workers, 30 per cent had a safety director, 54 per cent had a first-aid room, 19 per cent had a part-time physician, and 32 per cent had a full-time nurse.

These services fill a variety of functions in the different plants. Most common is the administration of a preliminary physical examination, and many plants supplement that with periodic examinations at regular intervals thereafter. In many cases, effort is made to correct any defects disclosed by these examinations. A study of 224 plants visited by the bureau in 1932 indicates that 50.9 per cent of them required physical examinations of all employees, while an additional 3.6 per cent reported that they required such examinations for employees in some classifications. One hundred per cent of the petroleum refining plants had this requirement, as did 82.2 per cent of those in iron and steel, 63.6 per cent in automobiles, and 60.9 per cent in foods. Lowest proportions were found in boots and shoes, 13.3 per cent, and southern textiles, 14.3 per cent. The study included manufacturers of automobiles and parts, clothing, food products, iron and steel, lumber, boots and shoes, petroleum, and textiles.

In many cases, plant medical facilities are intended to provide only emergency and preliminary medical attention in case of accident, but others are available for regular consultation, and still others provide the services of dentists, oculists, trained nurses, and even psychiatrists on a full-

time basis. Some of the medical departments have regular programs of conferences and lectures designed to educate workers for more healthy living, both in the plant and in their homes. Notable among significant recent changes in these services is the increasing attention being given to mental health.¹⁸

The costs of these facilities have been investigated by several agencies. A Massachusetts study involving some 90 leading firms of the state in 1924 found that medical department costs totaled 0.3 per cent of payrolls. In the same year, a survey by the National Industrial Conference Board found that, in 447 companies, the annual per capita expenditure for illness cared for by company medical facilities was \$5.14. In no instance was the cost of medical provisions in excess of 0.5 per cent of the payroll. Costs appear to run somewhat higher in small concerns than in larger ones.

Insurance and compensation. Health programs may be modified considerably if the United States should follow the lead of many European nations in providing compulsory health insurance for its citizens. One of the reasons why company medical facilities have proved so valuable, in many cases, is the current high cost of private medical services. Under European provisions, health insurance is generally coupled with socialized medical services, which greatly reduce the costs of medical care. During the depression, these services were greatly expanded in coverage, and they seem to have achieved much popular approval and support. Meanwhile, the federal Social Security Act of 1933 provides for experimentation along somewhat similar lines in this country. Its Title VI authorizes the appropriation of ten million dollars annually to the Public Health Service, of which eight million is available for assistance of state public health programs. If public provisions should become common here, it is unlikely that company provisions for any-

¹⁸ Kennedy, Foster, "Neurological Medicine in Industry," *Personnel Journal* April, 1937, Vol. 15, No. 10, pp. 360-364.

thing more than preliminary and emergency services could be justified.¹⁹

Meanwhile, a somewhat different development is tending to encourage management to expand its health programs. That is the tendency to provide workmen's compensation for industrial diseases. This development, also, is well established in the legislation of European nations, and an increasing number of diseases is being brought within the limits of compensation as additional legislation is enacted. Laws are not at all uniform, and three fairly distinct plans for providing such compensation are discernible. The most common, following the practice of England, lists specific diseases that are regarded as legitimate effects of industrial experience and are therefore compensable. That approach was in use in six jurisdictions in the United States in 1937. The number of diseases made compensable varied from ten to twenty-five, and the tendency to increase the coverage is unmistakable.

In sixteen other jurisdictions, one of two other arrangements was in use at that time. The first allows the term "injury" to be substituted in the compensation law for "accident." This provision features the laws of seven jurisdictions. In the other arrangement, followed in nine states, a blanket provision is incorporated in the compensation law allowing compensation for all industrial disease. Twenty-one states now require the reporting of all occupational diseases.

The inclusion of coverage for industrial illness will undoubtedly add to compensation costs, although such experience as is now available indicates that the added expense is small. It varies, as would be expected, with different occupations, but it appears to average about 2½ per cent of the usual cost of compensation for industrial accidents.

The experience of New York State in this connection may

¹⁹ See, Foster, W. J., and Taylor, F. G., *National Health Insurance*, London and New York: Sir Isaac Pitman & Sons, Ltd., 1934.

represent a fair sample. Cases of occupational disease which required compensation amounted to 2.19 per cent of all cases in 1933, 2.03 per cent in 1934, and 2.18 per cent in 1935. The number of weeks of compensation awarded for occupational disease represented 1.76 per cent of all weeks compensated in 1933, 2.5 per cent in 1934, and 2.32 per cent in 1935. Amounts paid out for compensation of occupational disease represented 1.81 per cent of all payments for compensation in 1933, 2.41 per cent in 1934, and 2.27 per cent in 1935. In 1936, compensation awards totaling \$500,000 were made in 1,882 disability cases, which represented about 2½ per cent of all compensated cases. The average compensation per case was \$290 for occupational diseases, as compared with an average of \$346 for accident cases. The experience of Wisconsin, a full-coverage state, is similar. There, in the 14-year period, 1920-1933, costs of compensation for industrial disease represent approximately 2.4 per cent of all compensation costs.

Exercises and Problems

1. Prepare a brief or outline of one of the studies and articles mentioned in footnotes throughout this chapter.
2. Indicate, in outline form, the types of analysis you would undertake as a basis for a safety program in a manufacturing industry.
3. Measure the relationship between accidents and education as shown by the following tabulation prepared by the personnel department of a large organization.

<i>Education (Years)</i>	<i>Number of Employees Having</i>	
	<i>One or More Accidents</i>	<i>No Accidents</i>
12	180	420
10	210	410
8	370	110
6	430	120

4. Given:

Total man-hours worked	4,500,000
Total days lost on account of accidents	1,350
Total number of lost-time accidents	90

 To find:
 - (a) Accident frequency rate.
 - (b) Accident severity rate.

5. Given:

Employment, beginning of the month	4,100
Employment, end of the month	3,900
Days lost from illness	80
Lost time illness cases	9

To find:

- (a) Illness frequency rate.
- (b) Illness severity rate.

6. Management seeks to discover the possible relationship between length of service with the company and accidents. It has prepared the following tabulation (reduced for problem purposes):

Employee	Accidents (Average per Year)	Years of Service	Employee	Accidents (Average per Year)	Years of Service
1	2.7	16	16	1.0	40
2	1.7	44	17	1.0	38
3	2.8	11	18	0.9	28
4	2.2	20	19	1.25	32
5	3.2	9	20	0.5	24
6	2.0	5	21	1.5	34
7	3.1	7	22	1.1	30
8	2.9	3	23	1.9	36
9	3.5	2	24	0.9	26
10	2.5	2	25	2.4	14
11	3.5	2	26	2.0	12
12	3.0	2	27	2.0	10
13	4.0	1	28	1.9	8
14	2.5	1	29	2.7	15
15	4.5	1	30	1.8	6

- (a) Measure the correlation by the ranking method.
- (b) Measure the correlation by the Pearsonian coefficient.
- (c) Estimate the average number of accidents for a workman with 20 years experience.
- (d) Note the standard error of this estimate.
- (e) Chart the relationship, showing the standard error of estimate.
- (f) Evaluate the coefficient of correlation by reference to the charts of significant and highly significant values in the appendix.

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CHAPTER XVII

Employee Morale, Interest, and Discipline

ONE of the most important and yet most intangible features of the coöperation of men and management in the production process is the condition that is generally described as employee morale. It is, in a sense, the positive aspect of a condition of which the negative side is unrest. If morale is high, then unrest is usually at a minimum; if morale is low, that condition provides a fertile field for the inception and cultivation of unrest.

Morale is a collective characteristic. It refers, as it is most commonly used, to the state of mind of the whole group of employees. In a sense, it might be described as their collective attitude toward their work, toward management, and toward the whole composite of conditions that, at the time, define their relationship to the organization. So regarded, it is paralleled by the individual attitude of each employee toward his particular part and place in the productive system as that is defined by his relationship to the employing organization. And an essential feature of that personal attitude toward the job is the employee's interest in his work, which, in its positive form, Tead and Metcalf have described as "essentially an attitude of continuing attentiveness." Just as morale is closely related to unrest, so also is interest. If an employee finds his work highly interesting, he is not particularly likely to evidence the dissatisfaction, discontent, and restlessness that are characteristic of unrest.

Moreover, both of these conditions—the collective characteristic of morale and the feature of individual interest—are closely related to problems of industrial discipline. For discipline, like unrest, becomes an increasing problem when

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morale is low and interest lags, while disciplinary problems decline in frequency and importance when the general tone of employee attitudes is favorable and when workers find their jobs truly interesting. It is for this reason that morale, interest, and discipline are jointly considered in this chapter.

Problems of interest and discipline. As is suggested by the preceding paragraphs, the personnel problems arising from unsatisfactory morale and from a lack of interest are primarily those which are lumped together in the general categories of unrest and disciplinary problems. Attention has already been given to some of the most obvious aspects and manifestations of unrest. A general lack of interest features the less spectacular but important phases of such problems. It shows itself in soldiering, stalling, a slowing of rates of production, a tendency to vary widely in both quality and quantity of work accomplished. It results in increased spoilage and breakage, with consequent higher overhead and labor costs.

The same condition gives rise to numerous and serious disciplinary problems. It shows itself in increased absenteeism, tardiness, and associated conditions, and it may readily break over into numerous infractions of shop rules, petty conflicts with foremen, and a general tendency to regard all controls imposed by management as unfair, improper, and unreasonable.¹

The nature of interest. Human interest is, in and of itself, a highly complicated characteristic. Most analyses relate it directly to certain more or less vaguely defined basic human motivations which are variously defined as instincts, appetites, drives, urges, wishes, and predispositions. One's interest is presumed to arise from the urge to satisfy these basic human needs, and interest appears in a measure proportionate to the opportunity provided for the satisfaction of these basic requirements. Thus, interest may be

¹ See, Pennock, G. A., and Putnam, M. L., "Growth of an Employee Relations Research Study," *Personnel Journal*, June, 1930, Vol. 9, No. 1, pp. 82-85.

aroused by the opportunity for recognition by one's fellow workers, or by the possibility of satisfying a craving for the new, untried, and novel, or by appeals to mechanical propensities or other elementary human driving forces. To the extent that employment conditions provide opportunity for the expression of these basic motivations, they awaken and hold the interest of workers. Similarly, insofar as the job fails to provide desired opportunities, it fails to awaken enthusiasm and interest. The implications of such analysis may sound simple, but the practical impossibility of clearly defining basic motivations and the wide ranges of personal variation in each of them make it exceedingly difficult to evaluate specific positions and desirable modifications in them.

At the same time, it is generally recognized that interest is closely related to fatigue. A highly interesting type of work may fail to hold the worker's interest after long periods of continued performance. Attention wanes, under such circumstances, and a reduction of interest accompanies or motivates the waning attention. It appears, according to Professor Poffenberger, that there is a fundamental tendency for attention to shift from one subject to another and that it is distinctly fatiguing to resist that tendency and concentrate attention. It is for this reason that any mental activity requiring sustained interest or attention is tiring, and fatigue reduces interest.²

In a sense, therefore, there is constant opposition between the appeal made to basic desires by opportunity for their expression on the job, on the one hand, and the increasing difficulty of maintaining interest as fatigue advances, on the other. In general, the greater the opportunity for expression, the stronger the resistance to fatigue, as has been dem-

²See, Bills, Arthur G., and Shapin, Milton J., "Mental Fatigue under Automatically Controlled Rates of Work," *Journal of General Psychology*, October, 1936, Vol. 15, No. 2, pp. 335-347; Remmers, H. H., "Measuring Attitude toward the Job," *Occupations*, June, 1936, Vol. 14, No. 9, pp. 945-949; Wyatt, S., and Langdon, J. N., *Fatigue and Boredom in Repetitive Work*, London, Industrial Fatigue Research Board, 1937.

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onstrated in numerous studies where highly interesting operations are compared with those of lesser appeal. There is always, however, the tendency of workmen to adapt themselves to even the most uninteresting tasks, a tendency that frequently obscures needed adjustments.

Means of increasing interest. From the standpoint of management, the problem of stimulating and maintaining employees' interest in their jobs may be met by two principle approaches. From one of them, the job is approached to discover how it may be modified to make it more satisfactory. From the other, the employee is studied, and effort is made to effect improved placements.

There are a number of fairly widely accepted means of increasing the interest-evoking qualities of the job. One of the most commonly effective of these consists in explaining the relationship of the job to the whole productive process, so that the worker has a conception of his part in the work of the whole and a realization of the importance of his contribution. The significance of each operation, however insignificant and simple it may appear, is thus explained, so that each operative may recognize his own contribution to the final product. At the same time, and working toward the same objective, various devices tend to develop a consciousness of "belonging" to the in-group of the productive whole. Sometimes, social affairs and facilities where employees may congregate and become acquainted have this effect. In other instances, inter-departmental contests may serve to develop a strong group feeling.

Simple mechanical adjustments frequently assist in breaking the monotony of certain operations. Thus, it may be that raw materials should be supplied more frequently, or that the job can be divided into smaller portions, thus permitting interruptions and shifts of attention. Where such adjustments are not feasible, rest periods may be introduced to break the monotony and improve attention. The need for such periods may frequently be determined by analysis of hourly production records throughout the day, and mechan-

ical devices are also available which measure the fatigue of particular muscles.⁸ If there is excessive fatigue, or if monotony is seriously affecting production, that condition is likely to be evidenced by a drop in production rates at about the middle of working periods. If rest periods are introduced, they should not ordinarily be expected to show improvement in hourly production rates for several weeks or even months, for experience indicates that it takes some time for workers to adapt themselves to new arrangements.⁴

It appears, also, that music may have distinct value in reducing monotony and fatigue and thus in preventing restlessness, and experiments with music indicate that it may increase efficiency at the same time.⁵

When jobs are known to be monotonous, it may be that some interest can be added by emphasizing employee suggestion systems, in which workers are encouraged to think seriously of possible improvements. Additional attention is given to such arrangements in a later section of this chapter. A systematic promotion program may be used in order to direct the attention of workers not only to the work immediately at hand but also to that of the positions next in line of promotion. Operations may, in many cases, be adjusted to facilitate a semblance of rhythm, in which case monotony appears to be greatly reduced, as is fatigue, and combinations of rhythmic operations with music offer real possibilities in this connection.

⁴See, Wyatt, S., *Rest Pauses in Industry*, London, Industrial Fatigue Research Board, 1927; Taylor, Harold C., "A Way to Reduce the Fatigue Allowance in Time Study," *Personnel*, February, 1937, Vol. 13, No. 3, pp. 83-93.

⁵See, Crowden, G. P., *Muscular Work, Fatigue, and Recovery*, London, Sir Isaac Pitman & Sons, Ltd., 1932; Laird, Donald, "The Influence of Noise on Production and Fatigue," *Journal of Applied Psychology*, June, 1933, Vol. 17, No. 6, pp. 320-330; Myers, C. S., "Some Recent Researches in Great Britain on the Psychology of Work," *Journal of the National Institute of Industrial Psychology*, October, 1931, Vol. 5, No. 8, pp. 423-433; Thompson, Lorin H., Jr., "Measuring Susceptibility to Monotony," *Personnel Journal*, October, 1929, Vol. 8, No. 3, pp. 161-171; Wyatt, S., and Fraser, J. A., *Effects of Monotony in Work*, Industrial Fatigue Research Board, Report No. 56, 1929.

⁶See, Tindall, Glenn M., "Rhythm for the Restless," *Personnel Journal*, October, 1937, Vol. 16, No. 4, pp. 120-124.

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If the job itself cannot be made more attractive and interesting, there is always the possibility of stimulating attention by readjusting the rewards for efficient performance. In many positions in modern industry, as Helen Marot once pointed out, rewards have been substituted for interest, on the assumption that these rewards can be so framed as to awaken interest in the end results of performance if not in performance itself.

Finally, jobs may be made more interesting by placing greater responsibility upon workers. The present employer-employee relationship tends to remove much of the interest in the job that attached to it when craftsmen completed the finished product and assumed a personal responsibility for it. When management tries to do all the thinking, there are few problems left to challenge the interest of intelligent workers. Any step in the direction of greater responsibility for workers is likely, therefore, to be a step in the direction of increased worker interest.

When the problem of interest is approached from the standpoint of possible adjustments in personnel, several such adjustments suggest themselves. Most obvious is improvement in selective and placement procedure. It is apparent that workers' interests, like those of all humans, differ greatly. There are workers who cannot tolerate a level of monotony upon which others thrive. The problem is essentially similar to that involved in promotions; workers who demand an outlet for a wide range of interests, like workers who crave advancement, must be placed in positions where the accomplishment of their desired objectives is attainable. Careful selection and placement is, therefore, highly important if interest is to be maintained at a satisfactory level.⁶

Where it is impossible to provide interesting work for all employees who demand such positions, interest may be maintained by shifting employees from one operation to another. The variation will in itself increase interest.

⁶ See, Hall, A. Milton, "The Disagreeable Job: Selecting Workers Who Will Not Be Annoyed," *Personnel Journal*, December, 1930, Vol. 9, No. 4, pp. 297-304.

Constant attention must be given to evidences of day-dreaming, both because it is generally not conducive to efficient performance on the job and, more important, because it is conducive to accidents. Some such indulgence in fantasies is probably unavoidable on most jobs, but it should be reduced to a minimum by varying and interrupting the work, and, if reveries are depressing to the worker or are devoted to adverse criticism of the worker's position and his relationship to the employer, interviews may be used to modify this condition.

In some cases, it may be quite impossible to secure, by ordinary managerial techniques, a satisfactory manifestation of interest from the worker. This condition characterizes emotionally and temperamentally maladjusted individuals and is not amenable to the therapy of management. Such individuals should have a thorough psychiatric and psychological as well as physical examination, in which attention can be given to the peculiar characteristics underlying the lack of adjustment.⁷

The plant magazine. One of the most useful devices for encouraging employees to feel that they are an important part of the whole organization is the plant magazine. It can best accomplish this important function by describing the work of the firm as a whole, explaining new developments and projects, interpreting new policies, and making personal reference to employees and their families. In a sense, it seeks to make employees feel that they are all members of a small community, so that all are interested in what each one is doing.

The plant magazine may also give publicity to contests and their results, to social affairs, and to all other news that is of general interest to employees. Several studies have clearly indicated the usual as well as the possible scope of

⁷See Mays Elton, "Maladjustment of the Industrial Worker," Cambridge, Harvard University Press, 1928; Appel, Kenneth, "Psychiatry in Industry," *Occupational Therapy and Rehabilitation*, August, 1931, Vol. 10, No. 4, pp. 207-316; McMurry, R. N., "Efficiency, Work Satisfaction, and Neurotic Tendency," *Personnel Journal*, December, 1933, Vol. 11, No. 4, pp. 301-310.

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these publications, and they indicate a wide range of usefulness, especially in the large business organization.⁸

Suggestion systems. It has long been recognized that one effective means of reducing and controlling disciplinary problems consists of providing outlets whereby employees are encouraged to express their grievances directly to management, thus "getting them off their chest," in the usual vernacular. The usefulness of such an approach arises from the fact that many infractions are directly traceable to employee opposition to or dissatisfaction with certain policies, programs, or individuals. Various devices have been used to facilitate expression of such grievances, including the employment of a system of regular, all-inclusive, and highly confidential interviews, in which workers are encouraged to make criticisms of anyone or anything without fear of retaliation. Probably, however, the most widely used device for this purpose is the employee suggestion system.

The suggestion system is not a new idea or recent innovation. It is said that one of the first was that installed by the National Cash Register Company in 1894. Most large concerns now have such systems, although there is considerable variety in their provisions and in the emphasis placed upon them, and there are concerns that make a business of installing such systems and supervising their operation.

The systems usually provide either individual or group prizes (sometimes both) for workers and shops or divisions supplying largest numbers of usable suggestions, and the latter may apply to any phase of management, managerial policy, or productive processes. They establish a committee representative of both management and workers to consider and approve or reject such suggestions. It has been found important to have the committee meet at regular in-

⁸Wissler, Willis, *Study of Content and Arrangement of Employee Magazines*, Columbus, Ohio State University Press, November, 1930; Lohr, L. R., *Magazine Publishing*, Baltimore, The Williams and Wilkins Co., 1932; *Employee Magazines in the United States*, second edition, New York, National Industrial Conference Board, 1927; *List of Employee Magazines*, fourth edition, Chicago, National Safety Council, 1930.

tervals, at times well known to all employees, and to see to it that the committee's decisions are made known with equal regularity. Generally, provisions include effective means of continually advertising the plan and of giving widespread publicity to those who are successful in having suggestions accepted and to departments from which large numbers of suggestions emanate.

Ordinarily, the plan is initiated and more or less continually supported with extensive publicity designed to show management's sincere interest in all sorts of suggestions. At the same time, effort is made to convince workers that they, too, profit from all worth-while suggestions, and to assure them that suggestions will not be used to force any of them out of jobs or to enforce more rapid performance. It has generally been found that some protection must be assured workers who develop patentable devices, so that they shall not lose whatever benefits are to be derived from such inventions, and it is highly important that when suggestions are rejected, their rejection be carefully explained to those who have sponsored them.⁹

The immediate results to be expected from such arrangements are fairly well known, for experience with them is already extensive. Numbers of suggestions vary greatly, apparently according to the type of work being done, the type of workers involved, and the attitude of management toward the suggestion system. An average of one suggestion per year per employee seems to be about what may be

⁹ See, Dickinson, Z. Clark, "Suggestions from Workers: Schemes and Problems," *Quarterly Journal of Economics*, August, 1932, Vol. 46, No. 4, pp. 617-743, also "Suggestions from Employees," Ann Arbor, *Michigan Business Studies*, August, 1927, Vol. 1, No. 3; also "Suggestion Systems Compared," *Personnel Journal*, March, 1928, Vol. 7, pp. 12-17, and "Suggestion System Operations, 1926-1931," *ibid.*, September, 1933, Vol. 12, pp. 16-22; Stanchfield, Paul L., and Dickinson, Z. C., "Suggestion Systems in 1932 and 1933," *Personnel Journal*, December, 1934, Vol. 13, No. 4, pp. 197-203; Manor, Sam, "Suggestion Schemes as a Means of Promoting Cooperation of the Worker in Industry," *Journal of the National Institute of Industrial Psychology*, April, 1929, Vol. 4, No. 6, pp. 340-347; Putnam, M. L., "Improving Employee Relations," *Personnel Journal*, February, 1930, Vol. 8, No. 2, pp. 314-325.

reasonably expected. In some industries as many as 85 to 90 per cent of all suggestions are found usable, but the average is probably around 30 to 40 per cent. By careful publicity, the percentage of usable suggestions may be improved, as is demonstrated by the experience of the Pennsylvania Railroad Company, where the proportions of suggestions adopted increased from 9.2 per cent in 1928 to 34.5 per cent in 1932. It is almost invariably true that a small portion of employees provide the bulk of all suggestions, and most employees make few if any contributions. The chief problem arising from the device is the placation of certain individuals who constantly advance suggestions, most or all of which cannot be effectively utilized.

If the plans are to prove of greatest value, they must be constantly surveyed to discover what departments and types of workers are not cooperating. Steps must then be taken to discover the reasons for this condition and to remove them. In effect, it is necessary constantly to call attention to the plan and re-sell it to employees. If it is so enlivened, however, it offers genuine positive values as a means of control, as a device for eliminating complaints, grievances, and frictions, and, at the same time, as an excellent means of identifying promising promotional material and educating the whole working force in managerial problems by causing them to regard such problems seriously.

Industrial discipline. That there is a necessary discipline in industry and business should be self-evident. While modern management, if it is alert and intelligent, is jealously guarding against every policy that could possibly be regarded as seeking to enforce a thoughtless subservience on the part of employees, it must be recognized that any sort of group action, if it is to be efficiently performed, requires coordination, control, and personal discipline. Industrial discipline is exactly of that sort. It seeks to eliminate practices that make for group inefficiency and to encourage those that facilitate effective cooperation. It tries to help workers to help themselves, just as the discipline imposed by

society in the form of social control seeks to advance the best interests of society.

The basic requirements of industrial discipline appear obvious and indisputable. All employees must cooperate for the good of all. Rules of the game, by means of which cooperation is made possible, make each worker more efficient. But workers, like citizens, frequently seek privilege and the suspension of the rules as far as their individual conduct is concerned. While citizens, for instance, do not question the desirability of traffic regulations, they now and then sneak through a stop-light or speed on an open highway. Sometimes, moreover, they do not see the reasonableness of the laws, as was strikingly evident in the prohibition era.

Workers are much the same on the job as they are on the highway. They may merely seek to avoid disciplinary regulations because they think it will do no harm for them to do so. Again, they may seriously doubt the reasonability of the rules themselves. In many cases, they completely lose sight of the purpose of such regulations and their relationship to the welfare of individual employees. They do not realize that any action that interferes with productive efficiency automatically lowers their value. Rather, they think of wages as determined by management rather than by the value of their services, and they see little or no relationship between shop rules and worker earnings.¹⁰

This common attitude on the part of workers is a result of the historic evolution of the controls in industry. In early industrial organization, management formulated, issued, and enforced its orders with little or no advice from or consultation with workers. Employees followed detailed instructions or they lost their jobs, and the right of management to take this arbitrary position was not widely questioned. Recent years have seen an increasing tendency away from this absolute control, however, and modern workers participate extensively in the determination of regula-

¹⁰ See, *Stealing and Pilfering in the Factory*. Washington, D. C.: Chamber of Commerce of the United States, 1928.

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tions surrounding their employment. In some cases, where workers are not organized in outside unions, their representation plans or company unions provide an effective medium for the determination of such rules as well as a forum in which they may be discussed and interpreted. Formulated there, these rules are usually summarized in employees' handbooks or other printed forms. Where employees are organized, the same result is achieved in the collective bargaining process, and the more important regulations may be incorporated in trade agreements.

Of course, a large part of all modern industrial discipline, like modern social discipline, takes no such formal shape as written regulations. Much of it is a matter of unwritten, traditional rules. The very fact, for instance, that the worker does not assume any right to the product upon which he has worked is an expression of the recognition of basic, traditional rules respecting the nature of private property in the productive process. It is only where traditional rules do not extend, where situations beyond the scope of established tradition require control, or where traditional controls must be changed that formal regulations are necessary.

Disciplinary policy. The essential nature of industrial discipline may well be kept in mind in formulating managerial policy respecting discipline. The most important purpose is simply increasing productive efficiency. Furthermore, it must be recognized that any serious disciplinary problem, unless the worker or workers involved are emotional or mental cases, indicates some weakness in management. Managerial policy should be preventive rather than punitive. Hence, alert management attacks disciplinary problems in their incipient stages before they emerge as problems. Similarly, it has been repeatedly said that all disciplinary action should have a positive rather than a negative effect, that is, it should encourage workers, including those particularly affected by it, to cooperate rather than to resent the action and resolve to retaliate. The

whole disciplinary phase of management is likely to be unsatisfactory if it results in disorganized employee morale and feelings of resentment and persecution rather than recognition of the reasonableness and propriety of disciplinary action. At the same time, disciplinary action must be effective; it must get results. It can be regarded as satisfactory only if it reduces offenses.

Employee indebtedness. A problem that has appeared to many managements to require disciplinary action is involved in the tendency of numerous employees to become involved in indebtedness to such an extent that executions on wages result. Garnishments account for two-thirds of these executions, and the other third is represented by assignments.¹¹ All such executions occasion distinct inconvenience to an employer, and it is but natural that many managements have sought to avoid this inconvenience. Some have adopted a policy of discharging employees whose wages are so attached, while others discharge an employee for a second or third offense of this sort. Many managements report that they provide funds from which employees may, if they are deserving, borrow under such circumstances, and these and other firms frequently require that the employee make an immediate settlement and secure a release from the creditor. Since this requirement may encourage unscrupulous creditors to take advantage of the employee, some managements assist employees in effecting an equitable settlement of the claim. No entirely satisfactory method of handling such cases has been devised, but it appears that lessened inconvenience as well as improved employee morale result from a policy that provides employees with advice and assistance in effecting immediate settlement, thus avoiding persistent executions.

Absenteeism and tardiness. Aside from infractions of shop rules, perhaps the most common disciplinary problems

¹¹ National Industrial Conference Board, *Service Letter IX*, No. 4, April 30, 1936. See, also, Nugent, Rolf, Hamm, John E., and Jones, Frances E., "Wage Executions for Debt," *Monthly Labor Review*, March, 1936, Vol. 42, No. 3, pp. 578-591.

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are those arising out of absenteeism and tardiness. Their reality as problems cannot be denied when it is recognized that they may result in serious interferences and delays affecting large numbers of employees who are forced to await substitutions or other adjustments. They are, moreover, frequently indicative of other, less apparent situations that offer similar disciplinary problems, for absenteeism and tardiness often reflect attitudes of dissatisfaction, unrest, lack of interest in the job, and grievance at real or imagined managerial policies.

Both absenteeism and tardiness vary greatly from plant to plant and from one business to another. They vary, also, from time to time. As many as 13 to 17 per cent of the employees in war-time industries were absent, and absenteeism runs as high as 10 per cent in modern industry, although that figure is almost a maximum. It probably averages about 6 per cent of all working time, and, if managerial policies are properly designed to attain that objective, it can readily be reduced to 4 or 5 per cent. Many instances would seem to indicate that, where no previous effort has been made to control it, intelligent managerial devices may readily reduce existing levels of absenteeism by 40 to 50 per cent.

In measuring these conditions, it is customary to describe absenteeism and tardiness *rates*. Those representing absenteeism are usually calculated as the ratio of the number of days or hours lost to the total number of days or hours for which employment was available, and the base period is most commonly a month. Thus, in a month in which there were 20 working days, a workman who missed one full day would have an absenteeism rate of $\frac{1}{20}$ or .05. In some cases, rates are thus calculated for individuals; in others they are measured by reference to the shop or the plant as a whole.

Tardiness rates are calculated in a somewhat different manner. The most common method measures the rate as the ratio of the average number of tardinesses per day to

the average number on the payroll, all on a monthly basis. Thus, if in a month of twenty working days the average number of tardinesses per day was 20 and the average number on the payroll was 160, then the rate would be $\frac{20}{160}$ or .125. Sometimes these rates are recalculated on an annual basis, for purposes of comparison, but the basic ratios remain the same.

Preliminary analysis of disciplinary problems. Certain types of disciplinary problems must, of course, be handled on a personal basis. The most frequently used device is the interview, and its purpose should always be to secure the agreement of the offender upon a future course of action that will increase coöperation. Much has been written about this type of interviewing, but there are no panacean principles or procedures. Rather, what is necessary is that the interview be so conducted that the offender is led to see, first, the reason for the rule, and, second, his own interest in its observation. Management must be represented not as a self-imposed dictator but merely as the enforcement agency, operating in the interest of all employees.

For the more serious infractions, interviews may be used, but much preliminary investigation may well precede such treatment, for it is likely that causes of the difficulties may be found to lie in conditions at least partially beyond the control of employees. Since absenteeism and tardiness form the bulk of such cases, they may be used as illustrative of this approach. The most frequent causes of absenteeism are generally found to be illness or death in the family, accidents, business situations affecting the worker's family, and dissatisfaction with work. Investigations of tardiness disclose, as its most important causes, fatigue, transportation difficulties, housing problems (difficulties in finding homes close to work), absence of recreational facilities, and climatic conditions. Greatest tardiness generally occurs on work-days following holidays and on Monday mornings.

More detailed study clearly indicates, however, that although these causes are most common in occasioning absence

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and tardiness, they do not affect all workers in the same degree. In both tardiness and absence cases, it is found that there are recidivists and that a comparatively small proportion of all employees is responsible for a large portion of all offenses, that chronic offenders and repeaters represent a distinctly significant aspect of the problem.

The first step in reducing these infractions, therefore, involves a careful study of the records to discover where and when the problems appear and what types of workers are responsible for them. Offenses may be classified as to department, division, occupation, time, or in any other manner that may help in getting at their causes. Only by such careful analysis can offending situations and significant managerial causes of disciplinary problems be discovered. In the same way, comparisons of the seriousness with which infractions appear under varying conditions as to working hours, wages, and other related circumstances may suggest important sources of disciplinary problems in conditions dictated by managerial policy.

One of the most useful types of analysis is directed at the discovery of types of employees involved in infractions. One reasonable question in that connection concerns the length of service of the worker. In order to evaluate data secured in answer to that question, individual disciplinary experience may be correlated with length of service. Such comparisons will indicate whether experience in the organization instills habits of observance or of violation, so far as rules are concerned, and it may prove effective in suggesting the need for changing methods of training.¹²

Many other personal characteristics of employees may be found to be significant in explaining problems of this type. For this reason, comparisons may profitably regard differences in rates for married and unmarried employees, for various wage classes, for different age groups (older workers generally show lower tardiness and absence rates), for the

¹² See, Ho, C. J., "Which Workers Have Good Attendance," *Personnel Journal*, February, 1929, Vol. 7, No. 5, pp. 385-389.

sexes (women generally have higher rates for both tardiness and absence), and possibly for different racial, religious, or educational groups. In order that such comparisons may have maximum value, it is essential that careful records of tardiness, absence, and all other infractions be maintained. The reporting of these conditions is handled in a variety of ways. In some cases, all workers who are tardy, for instance, are required to report to the personnel or departmental office before they go to their work. Such a requirement has many disadvantages, not the least of which is the fact that it appears primarily as a punitive measure. Moreover, the reporting is likely to be a perfunctory gesture, for it is generally desirable that the worker be sent to his job as soon as possible. It is probably better, therefore, merely to have an inclusive system of reporting. Sometimes, it is provided that all absences and tardiness shall be reported within the first hour of work, but even this requirement appears to be largely a matter of gesture rather than of actual value to management. What is really important is that reports shall be uniform, inclusive, and regularly made.

Statistical tools. In analyzing the data of disciplinary cases, many of the techniques described in preceding chapters will be found useful. In some cases, average rates for different departments, divisions, sexes, age groups, length-of-service classes, races, nationalities, and other distinctive groups may be compared. Perhaps, some of these conditions may be effectively correlated, such as, for instance, length of service and tardiness, absence, or other infractions. Similar correlations may measure co-variation in wages and infractions, or in numbers or frequency of offenses and age or years of education. In still other cases, similar interrelationships may be measured by means of the bi-serial coefficients described and illustrated in Chapter XV, by means of which, for instance, numbers of infractions may be compared with promotions, or with membership in an outside labor organization, or in a company union. In all these correlations, it is important not merely to secure a

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measure of possible co-variation but to evaluate this measure to see whether or not it is likely to be merely accidental or is so large as to be definitely beyond the realm of mere chance. Tables and charts, such as those shown in Appendices G and H, effectively answer this question. At the same time, it is possible to compare various interrelationships and to discover which of them are most important.

Frequently, it may be desired to measure an interrelationship between disciplinary conditions that are not quantitatively measured and similar non-quantitative characteristics of employees involved in such offenses. Thus, it might appear valuable to obtain a measure of co-variation between disciplinary offenses and graduation or non-graduation from high school, or between disciplinary cases and attendance at training classes, or between the tendency to get into difficulty and participation in certain group social activities. To illustrate such an analysis, the following situation may be hypothesized: of the 150 employees of the company, 15 have records showing one or more infractions of the rules in the current year. At the same time, some 125 of the employees are active participants in a program of social affairs sponsored by the management to provide recreational opportunities for employees. The way in which these two conditions characterize employees might be summarized as shown in Table XII.

TABLE XII
CO-VARIATION BETWEEN SHOP INFRACTIONS AND PARTICIPATION IN
SOCIAL PROGRAM

Data: Assumed for illustrative purposes.

Participation in Social Program	Disciplinary Cases		
	Involved	Not Involved	Total
Non-participants.....	10 (a)	15 (b)	25 (g)
Participants.....	5 (c)	120 (d)	125 (p)
Totals.....	15 (q')	135 (p')	150

As in many other instances where the techniques of correlation are useful, the purpose of analysis may be to compare the measures of co-variation and thus to discover which appear to be more significant, or it may be merely to determine whether any of the relationships is statistically significant and therefore worthy of further investigation. There are relatively simple and effective techniques available for these purposes. For a simple, four-fold classification, such as that illustrated in the example, the calculation of the coefficient of point correlation (symbol ϕ) is probably most convenient. When the frequencies in the cells and their totals are designated as shown, the coefficient is calculated as

$$\phi = \frac{ad - bc}{\sqrt{pq p' q'}} = \frac{(10 \times 120) - (15 \times 5)}{\sqrt{125 \times 25 \times 135 \times 15}} = \frac{1125}{\sqrt{6328125}} = 0.448.$$

The significance of ϕ may be simply appraised by reference to the fact that values of $n\phi^2$ in excess of 3.841 may be expected to occur only once in twenty times (5 per cent) by chance, while values of $n\phi^2$ in excess of 6.635 may be expected to occur only once in one hundred times (1 per cent) by pure chance. The product thus evaluated, $n\phi^2$, is also equal to χ^2 , and values of χ^2 may be readily measured, as to their significance, by reference to the chart in Appendix I. The curve, $n - m = 1$, is always used for four-fold correlation.

Somewhat more frequently used in such situations is the *coefficient of mean square contingency* (symbol C), which is considerably more adaptable, since it may be applied to any number of cross-classifications. The simplest method of calculating this coefficient is illustrated in Example 26, where the data used in the preceding paragraphs are again utilized. The procedure may be briefly summarized as follows: (1) values of Z for each cell are first calculated as shown in the example; (2) their total for all cells is noted; (3) the total is reduced to ϕ^2 by subtracting 1; (4) C is found by substitution of the ϕ^2 value in the equation indicated.

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EXAMPLE 26

MEAN SQUARE CONTINGENCY

Data: See Table XII.

Participation in Social Activities	Disciplinary Cases		
	Involved	Not Involved	Total (f_r)
Non- Participants	f 10 $Z = \frac{10^2}{25 \times 15} = .267$	f 15 $Z = \frac{15^2}{25 \times 135} = .06675$	25
Participants	f 5 $Z = \frac{5^2}{125 \times 15} = .01335$	f 120 $Z = \frac{120^2}{125 \times 135} = .855$	125
Totals (f_c)	15	135	150

$$Z \text{ (for each cell)} = \frac{f^2}{f_r \times f_c}$$

$$\Sigma Z = 1.202 = \phi^2 + 1$$

$$\phi^2 = 1.202 - 1 = .202$$

$$C = \sqrt{\frac{\phi^2}{1 + \phi^2}} = \sqrt{\frac{.202}{1.202}} = \sqrt{.167} = .408$$

The co-variation may be evaluated as to significance by two methods: either (1) by reference to the ϕ^2 value for four-fold classifications, or (2), for several classes and a large number of items, C may be compared with the charts of significant values of r , Appendices G and H, since C is comparable to r when there are several classes, n is large, and the distributions are fairly normal.

Measurement of correlation by means of the coefficient of point correlation and the coefficient of mean square contingency will be found convenient in many connections other than those mentioned in this chapter, and the two techniques will serve effectively, both as means of measuring co-variation and of discovering to what extent apparent association may be regarded as mere chance effect or may exceed the probabilities of accidental relationships.

As has been mentioned, the coefficient of mean square contingency may be calculated for any number of cross classes,

that is, two-by-two, three-by-three, three-by-four, and so on.

Disciplinary action. The determination of policies with respect to disciplinary action will reflect the results of such analysis as has been described in preceding paragraphs. To the extent that working, living, or transportation conditions appear to be partially or wholly responsible for recurring offenses, steps must, of course, be taken to rectify these conditions. Where particular departments or divisions show disproportionate numbers of cases, they may well be investigated to discover the explanation of this condition. If particular classes or types of workers appear too prominently in disciplinary cases, the selective program may well take this fact into account, while, at the same time, steps may be taken to readjust the working conditions of offending groups. If analysis discloses that certain types of group activities appear to provide a means of preventing or reducing infractions, then such activities may be expanded or so arranged as to include larger numbers of workers.

In dealing with chronic offenders, several courses of action are open. Basic to all of them is a careful analysis of individual cases to discover, if possible, mainsprings of the difficulties involved. When a case is thoroughly understood, the offender may be interviewed by a representative of management, or it may be found more effective to have such cases handled by committees made up of employees. In any case, punitive action should always be regarded as of secondary importance, and primary emphasis should be placed on effecting a readjustment in the attitudes of the employee, to the end that his future behavior may be voluntarily and enthusiastically coöperative rather than merely fearfully submissive.

Some managements have sought to prevent offenses of a minor nature by a sort of expanded policing of employee's actions. They send nurses out to call at the homes of all absentees, or telephone homes if workers are tardy or ab-

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sent. While such methods almost certainly reduce these offenses, they are likely to create distinctly unfavorable attitudes toward such paternalistic management, for which reason their net value is exceedingly doubtful.

Current managerial opinion is widely divided as to the desirability of providing automatic rewards or penalties in connection with disciplinary policies. Many firms have long followed a procedure in which minor infractions, if they exceed certain limits, automatically result in fines, pay reduction or docking, loss of vacation rights, or other similar penalties. All such devices are highly effective with certain types of employees and quite unsatisfactory, if not actually dangerous, with others. For the latter, such penalties tend to develop feelings of resentment and dissatisfaction, since in many cases the worker feels that automatic, iron-clad rules operate unfairly and do not take individual circumstances into account. Further, it is entirely possible that employees may be so extensively penalized that no incentive for avoiding further infractions remains. Thus, once an employee has been tardy so many times as to lose his vacation rights, what reason is there remaining for punctuality?

The provision of rewards for non-infraction is but the positive aspect of a practice in which penalties are a negative phase. Common practice frequently makes use of such rewards, and their most common form is the individual or group bonus. Several studies seeking to evaluate the use of these devices have been made. A study of 1000 firms, undertaken by the National Industrial Conference Board in 1925 indicated that 112 of them had bonus provisions as rewards for regular attendance. A similar study undertaken in 1927 found that such bonus provisions involved amounts aggregating about 5 per cent of the annual earnings of workers who received them. While few firms that have tried such arrangements have later discarded them, serious questions as to their value and effectiveness, if not their actual propriety, are raised. One school of thought on

the subject can see no point to provision of rewards in the form of extra compensation for what may be regarded as merely the regular and proper type of behavior. It questions the reasonableness of paying workers for doing exactly what, in their own best interests and those of fellow-employees, they should expect to do. Furthermore, there is real question as to whether these arrangements providing rewards, like those which provide penalties, may not have effects quite opposed to those intended, since, as soon as any employee has become disqualified, the incentive to avoid infractions is completely removed as far as the bonus is concerned. Possibly some sliding scale arrangement might overcome this objection.

There is some question as to which type of bonus arrangement, the individual payment or the group award, is most effective. It is likely that the answer to this question depends upon the nature of the work and the type of workers involved. Where individual absence or tardiness reduces the efficiency of the whole group, some sort of collective reward might operate effectively; where workmen operate independently and are quite individualistic in attitude, the personal reward would be more appropriate.

In the past, it was not uncommon for management to employ industrial spies to check on observance of rules and to report offenders. Recent Senate investigations have added to the authoritative evidence indicating the widespread use of these agents and they indicate that, in certain industries, practically all large firms have rather continually employed outside detective agencies to provide operatives for this purpose.¹⁸

It may be said without serious question that if such techniques and devices are used, then most of the methods described in this and preceding chapters will be found useless; indeed, no really valuable personnel program will be

¹⁸See, for detailed descriptions of these practices and their extent, the report of the Senate Committee investigating labor espionage in 1936 and 1937.

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found possible. Any effective program of positive action leading to increasing efficiency in the use of labor power must depend largely upon the development of a high level of morale on the part of employees for its success; it must evoke their positive cooperation and their conscientious interest in and approval of management and its policies. The use of industrial spies operates in exactly the opposite direction. It foments suspicion and fear, and it soon convinces employees that they and their interests must be regarded as directly opposed to the interests of management. It is, in a sense, a subtle declaration of war between management and men. It is opposed to practically every device modern personnel administration has developed to increase confidence and cooperation. In addition, it has been repeatedly shown that operatives so employed continually misrepresent situations and workers to management and frequently foment trouble to make their continued employment appear essential.

Discharge. Probably the most widely used of all disciplinary measures is discharge. It is the established therapy for all kinds of disciplinary problems. Yet it is, at the same time, one of the least satisfactory. It means, in many cases, that management loses the services of an experienced employee whose training and experience have been gained, to some extent, at management's expense. It necessitates "breaking in" a new worker somewhere along the line, and that process is always more or less expensive. It is frequently a source of ill-will toward management, both from the worker involved and his immediate friends and also from other employees and the industrial community. It may have decidedly unfortunate effects on the morale of other employees, especially if the circumstances surrounding the case are unknown or are misrepresented. Moreover, with increasing legislative provisions requiring dismissal compensation and unemployment benefits, it may be directly expensive to management. Finally, more extensive collective bargaining has tended to restrict management's free exercise

of the power to discharge and has forced a more diplomatic policy with respect to all arbitrary disciplinary measures.

Under the circumstances, it is not surprising that managerial policies with respect to discharge have undergone comprehensive change in recent years. Whereas it was more or less customary to permit any foreman or subordinate executive to fire at will in the past, the more common present practice is to require that responsibility for this action shall be concentrated in the hands of one official or department. In many cases, discharge is to be resorted to only under carefully pre-determined conditions, and such conditions are fully described in employee's handbooks or in collective agreements. Frequently, it is provided that all employees shall be entitled to a hearing before a committee representative of fellow-workers as well as management before final action is taken, and the committee may be vested with final authority for such action. The whole point of view toward discharge regards it as a means to be utilized only as a last resort after all other possible attempts have been made to secure satisfactory cooperation.¹⁴

Exercises and Problems

1. Prepare a brief outline of one of the articles and studies to which reference is made in the footnotes throughout the chapter.
2. The following tabulation summarises individual tardiness rates (calculated as the number of times tardy per hundred starts) for 310 employees of a banking organisation. It is desired to discover whether there are significant differences between age groups.

Make the necessary calculations and indicate your conclusions.

Age Groups	Tardiness Rates									
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20
20-25	2	3	2	4	4	4	5	4	3	3
25-30	3	2	2	6	3	7	6	7	2	1
30-35	2	5	4	8	8	10	6	8	1	2
35-40	5	7	6	7	6	9	3	9	4	4
40-45	7	9	4	5	1	10	9	9	5	4
45-50	1	4	2	5	3	10	11	13	5	6

¹⁴ See, Marks, A. M., "Placement, Transfers, and Dismissals," *Personnel*, November, 1928, Vol. 5, No. 3, pp. 243-248; Schwenning, G. T., "Protection of Employees Against Abrupt Discharge," *Michigan Law Review*, March, 1932, Vol. 30, pp. 666-698.

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3. Management seeks to discover whether there is a significant association between the tardiness rates tabulated in exercise 2 and age of employees. To this end, it calculates a coefficient of correlation and compares it with possibilities of chance correlation.

Make the necessary calculations and evaluate the coefficient by reference to the charts, Appendices G and H.

4. The following tabulation of employees compares disciplinary actions with membership in the employee representation plan. Management wishes to discover whether there is probably more than a chance association in these conditions.

Measure the association by calculation of bi-serial r .

<i>Disciplinary Actions</i>	<i>Representation Plan</i>	
	<i>Members</i>	<i>Non-Members</i>
0	70	43
1	62	68
2	41	149
3	21	181
4	6	39

5. Measure the co-variation shown by the tabulation in exercise 4 by calculation of the bi-serial η .

6. The tabulation below presents a fourfold classification of employees so arranged as to indicate the possible relationship between disciplinary action and promotions. Measure the co-variation by calculation of ϕ , and evaluate the significance of this co-variation by calculation of χ^2 .

<i>Disciplinary Action</i>	<i>Promotional Experience</i>	
	<i>Promoted</i>	<i>Not Promoted</i>
Non-offenders	73	231
Offenders	27	669

7. Apply the technique of mean square contingency analysis to the data of exercise 6 and secure the coefficient.

8. In analyzing the results of its suggestion system, management sets up the following tabulation:

<i>Rating</i>	<i>Suggestions</i>	
	<i>Accepted</i>	<i>Rejected</i>
Excellent	371	139
Fair	243	337
Poor	127	413

Measure the co-variation or association in these variables, calculating the coefficient of mean square contingency, and evaluate its significance by measurement of χ^2 .

9. Management seeks to measure possible relationships between conditions that may be associated with tardiness. The following data represent a small sample of the data to be analyzed, selected for problem purposes:

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Employee	Years of Service	Distances in Blocks	Tardiness Rate
	X_1	X_2	Y
A	4	4	.5
B	5	2	.8
C	7	6	.8
D	8	3	.9
E	5	7	1.0
F	8	5	1.2
G	8	8	1.5
H	7	15	2.0
I	10	20	2.5
J	8	20	3.0

Discover the simple coefficients of correlation and evaluate their significance. Chart the relationships, with regressions and standard errors of estimate.

Collateral Reading

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CHAPTER XVIII

Causes of Unstable Employment

MANAGEMENT'S interest in employment stabilization fluctuates with current employment conditions. When unemployment is extensive, much is said and hurried steps are taken to attempt stabilization; when employment reaches peaks in periods of prosperity, attention tends to wane. There has, however, been a growing feeling in recent years that stabilization deserves continued attention, and there are reasons to expect that this belief will receive increasing support from management. For one, the widespread provision of compulsory unemployment insurance following the passage of the Social Security Act in 1935 has operated in this direction. The federal Act and several of the state laws have provisions by means of which employers may secure reductions in taxes assessed against them by stabilizing or guaranteeing employment.

Meanwhile, public opinion has come to expect employers to assume increasing responsibility for steady work, and management has become increasingly aware of both direct and indirect costs of unstable employment. Among the former are the obvious losses arising from idle machines and equipment, the costs of relief (both in direct assistance to employees and in growing taxes), and the serious losses of experienced, thoroughly trained employees who may be forced to seek employment elsewhere. At the same time, the workers' feeling of a lack of security is reflected in their lessened productive efficiency, and their concern over possible losses of employment may seriously affect performance. Several employers have clearly demonstrated that

guarantees of steady work can be expected to increase productive efficiency of employees.¹

Sources of data on employment. It is widely recognized that there is great instability of employment in certain industries and that there are many sources and types of instability.² Moreover, they appear in different industries at different times. Practically all types of business show some instability, but the individual differences characterizing particular industries are pronounced. Thus, the extent of a single type, seasonal unemployment, varies widely. It has been estimated that, largely on this account, workers in bituminous coal are idle, on the average, 31 per cent of each year, clothing workers about the same, shoe workers are idle about 35 per cent of the time, and building tradesmen are out of work some 39 per cent of the time. Certain industries, moreover, are widely recognized as unstable and providing only casual employment. It is generally understood that longshoremen and dock workers are subject to this condition in their employment.

This distinction between industries does not, however,

TABLE XIII
ESTIMATE OF UNEMPLOYMENT IN INDUSTRIES CUSTOMARILY COVERED BY
UNEMPLOYMENT-INSURANCE PLANS

Year	Estimated % of Unemployment	Year	Estimated % of Unemployment
1922	13.1	1929	6.1
1923	7.3	1930	15.3
1924	9.4	1931	26.6
1925	7.8	1932	39.0
1926	7.4	1933	39.2
1927	8.3	Average for 12 years	15.3
1928	8.5		

¹ See United States Senate, Committee on Education and Labor, *Unemployment in the United States*, Senate Report No. 2072, Washington, D. C., 1929.

² See, Hurlin, R. A., and Berridge, W. A., editors, *Employment Statistics for the United States*. New York: Russell Sage Foundation, 1926.

prevent extensive fluctuations from affecting industry as a whole. The Committee on Economic Security appointed by the president to lay a foundation in fact for the Social Security Act of 1935 attempted to estimate the proportions of workers who would, under most existing systems, be covered by unemployment insurance and who had been unemployed in each year from 1922 to 1933. Their estimates are summarized in Table XIII.

It should be clearly understood that the table includes estimates of unemployed only for those who would normally fall under the protection of unemployment insurance. Proportions for all gainful workers would probably be considerably lower, in the opinion of the committee.

Although there is general recognition of the seriousness of employment instability, there is little nation-wide data that is extensive, accurate, and reliable. Principal sources of nation-wide information consist of federal population censuses, censuses of manufactures, samplings from various areas, limited current reports from selected industries and firms, and current estimates by unofficial organizations. In November, 1937, the federal government sought to secure current information on unemployment by means of a nation-wide registration. The data thus secured are the first nation-wide figures obtained by governmental action excepting those available from the decennial census.

Five federal censuses have included enumerations of the unemployed—those of 1880, 1890, 1900, 1910, and 1930. In only three of them, those of 1890, 1900, and 1930, were the employment data published, and the information of the first two of these counts is not comparable with that secured in 1930.

The 1930 census secured information as to actual employment on the day previous to the call of the enumerator. Seven classes of the unemployed were distinguished in that enumeration, including:

1. Persons out of a job, able to work, and looking for a job.

2. Persons having jobs but on lay-off without pay, excluding those sick or voluntarily idle.
3. Persons out of a job and unable to work.
4. Persons having jobs but idle on account of sickness or disability.
5. Persons out of a job and not looking for work.
6. Persons having jobs, but voluntarily idle without pay.
7. Persons having jobs and drawing pay, though not at work (on vacation, etc.).

Census conclusions with respect to employment and unemployment were determined from this classification of the unemployed. More frequent enumerations of the number employed in a limited group of occupations are available from the federal censuses of manufactures, formerly taken at 5-year intervals, but now undertaken at 2-year periods.

Among the best of the sampling surveys have been those undertaken by the Metropolitan Life Insurance Company in 1915 and in 1930.³ Other more limited surveys have also been made in many sections of the country.

For current data as to employment, reference may be made to indexes maintained by the Bureau of Labor Statistics since July, 1922, reporting the percentage of full time worked in manufacturing industries, and to estimates of employment since January, 1929.⁴ The earliest published indexes were released by the Bureau in January, 1924, and regular reports now appear in each issue of the *Monthly Labor Review*. They cover 90 manufacturing industries which included some 23,661 separate establishments and 3,726,413 employees in June, 1935. This series was revised in April, 1934, and placed on a base representing the average of 1923-1925, and revised indexes now extend back to 1910. There is now available, also, a current measure of employment in 16 nonmanufacturing industries, and in

³*Cf.* Meeker, Royal, "The Dependability and Meaning of Unemployment and Employment Statistics in the United States," *Harvard Business Review*, July, 1930, Vol. 8, No. 4, pp. 385-400.

⁴See estimates of employment in the *Monthly Labor Review*, June, 1937, Vol. 44, No. 6, pp. 1420-1421.

June, 1937, the Bureau of Labor Statistics released employment estimates for the total of all industries, in which comparison was made between employment in March, 1937, and the same month in 1929 and in 1933 (see Appendix B for Summary data to March, 1937). It is possible that this over-all figure may be made a regular and continuing feature of the statistics regularly presented in the *Monthly Labor Review*. Other series currently available from the Bureau of Labor Statistics include the construction industries (since 1931) and employment by federal governmental agencies, and the Bureau's regular monthly summaries also include data on railroad employment compiled by the Interstate Commerce Commission.⁵

Factory employment indexes are also released by the Board of Governors of the Federal Reserve System in the *Federal Reserve Bulletin*, but they are merely seasonally adjusted figures derived from the series provided by the Bureau of Labor Statistics.

Main dependence, as far as current information as to nation-wide employment and unemployment is concerned, must, therefore, be placed on estimates. The federal Department of Labor has, from time to time, provided the executive branch of the government with estimates of unemployment, and, in 1937, it began releasing monthly estimates of employment, which were extended back to 1929 (see the table in Appendix B). Estimates of both employment and unemployment have been made at irregular intervals by the Alexander Hamilton Institute of New York. For regular monthly estimates of unemployment, available currently throughout the years since 1929, however, business has had access to three principal sources. The National Industrial Conference Board has given out such figures each month from April, 1930, to March, 1936, and occasional estimates have appeared since the latter date. Beginning in January,

⁵Olenin, Alice, "Gathering Employment Statistics," *Labor Information Bulletin*, February, 1937, Vol. 4, No. 2, p. 13*f*. The 89 manufacturing and 16 nonmanufacturing industries for which data are regularly available are noted in Appendix A.

1930, Colonel Leonard P. Ayres of the Cleveland Trust Company calculated regular monthly figures for unemployment until March, 1936. A third source is the American Federation of Labor, which has provided regular monthly estimates since January, 1929, and continues to release these figures in its *American Federationist*. The estimates available from these sources have been charted in Figure 31.⁶

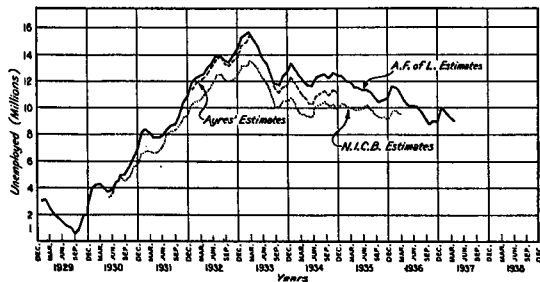


Fig. 31.—Monthly Estimates of Unemployment in the United States.

In general, it may be said that certain characteristics of the incidence of unemployment are well recognized. Capital goods and durable goods industries suffer most seriously from cyclical unemployment, while consumption and non-durable goods industries are most seriously affected by seasonal fluctuations. It is further known that, for industry as a whole, January shows lowest employment and October shows the highest employment, and that layoffs represent more than one half of all separations.

An index of stability. It has been found that a simple index of employment stability, as far as seasonal fluctuations are concerned, is convenient as a means of year-to-year com-

⁶ See, "The Federation's Revised Unemployment Estimate," *American Federationist*, January, 1936, Vol. 43, No. 1, pp. 64-73; Nathan, R. R., "Estimates of Unemployment in the United States," *International Labour Review*, January, 1936, Vol. 33, No. 1, p. 25ff; "International Index Numbers of Employment," *ibid.*, May, 1937, Vol. 35, No. 5, pp. 724-733.

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parisons within industries and firms, between firms in a single industry, and for other similar purposes. The index most frequently used in this connection defines stability as the ratio of employment in the average month of the year to that in the maximum month. In formula form, this index appears as

$$S = \frac{F}{MF}$$

where F represents the working force in the average month, and MF is the force in the month of maximum employment. Indexes for industries as a whole have been prepared by the Bureau of Labor Statistics for iron and steel, automobiles, men's clothing, and transportation. The index obviously emphasizes seasonal variability and fails to distinguish cyclical and trend influences. For this reason, depression years of low employment may readily show high stability. The usefulness of the measure is distinctly limited.

Statistical analysis of employment. The first step in employment stabilization within the firm or business is the discovery of the types of unemployment with which it is affected and the relative significance of each type. What is desired is to know what types of unemployment or of instability feature past employment experience and how much of each is apparent at any given time. In other words, if employment is low in October, 1937, it is desired to know to what extent that condition may be attributed to seasonal influences, to what extent it is a reflection of trend, how much part cyclical fluctuations play in it, and what other types of instability may be involved.

There is no single best way or means of accomplishing such analysis. A fairly carefully drawn chart of monthly totals or averages of employment extending over a number of years will frequently prove suggestive as to what types of instability have contributed to the whole panorama of change. For instance, the employment data of Figure 32, representing monthly averages in a food manufacturing

concern, suggests that several types of unemployment have been involved in the extensive fluctuations shown there. It is apparent that the data show something in the nature of a downward trend, so that the influence of trend has contributed to lessening employment in later years. Such a change may reflect technological advances in the industry. At the same time, there is an obvious seasonal influence in

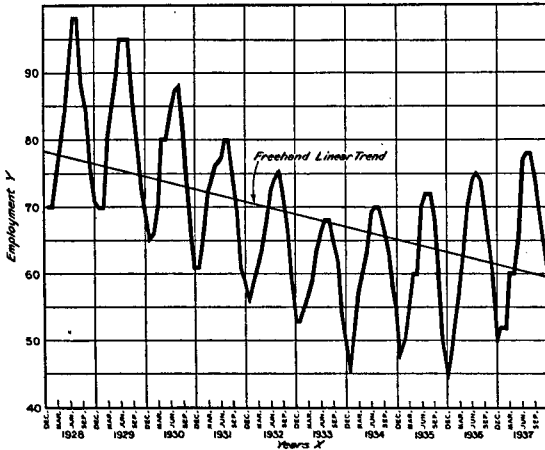


Fig. 32.—Freehand, Linear Trend of Employment in a Small Firm. (Data: see Table 14.)

which certain months regularly appear higher than others. Toward the close of the period, it is probable also that there is a reflection of a widespread business recession generally referred to as cyclical unemployment, although the data are not sufficiently extensive to make this relationship at all conclusive.

If any satisfactory long-time plan of stabilization is to be put into effect, it is necessary that these various types of

instability be recognized, isolated, and measured, so that compensations and adjustments can be adapted to them.

Trend analysis. It is important, at the outset, to secure some conception of the trend in employment, both as a basis for further analysis and as a suggestion with respect to future employment. While forecasting is highly dangerous in certain industries where technological change may suddenly alter the whole course of the business, and while it requires extensive data running over many years to be at all satisfactory, some such estimate of the immediate future is clearly necessary in attempting to stabilize employment in that future.

It should not be assumed that what is desirable in this connection is merely the discovery of a trend in employment as a whole. In many cases, that is not so important as the determination of trends in the employment of particular groups of workers. It will frequently be found that trends for various groups differ greatly. Thus for the country as a whole, the years 1910 to 1930 were characterized by a trend toward a rapidly increasing number of professional, clerical, and skilled workers and foremen. Meanwhile, unskilled workers and proprietors, managers, and officials were decreasing in proportions. Facts such as these with respect to individual enterprises enable intelligent placement as well as effective plans to stabilize employment.

There are many possible means of discovering trends in employment data. A first step in all of them is the preparation of a chart somewhat like that shown in Figure 32, although it may be equally satisfactory merely to plot annual data representing monthly averages for each year. Inspection of such a chart will suggest the nature of the appropriate trend, and there are a variety of trends that may, in different situations, be found useful. Ordinarily, the more complicated types of fitted trends are neither useful nor justified by employment data, so that greatest dependence must be placed upon straight lines and fairly simple curves for this purpose.

In the great majority of cases, the so-called "free-hand" trend may be entirely satisfactory in picturing the composite direction of change in the data. A transparent ruler, carefully located to divide the data as nearly evenly as possible, may be conveniently used to sketch a trend, which has been illustrated in Figure 32. A simple mathematically lo-

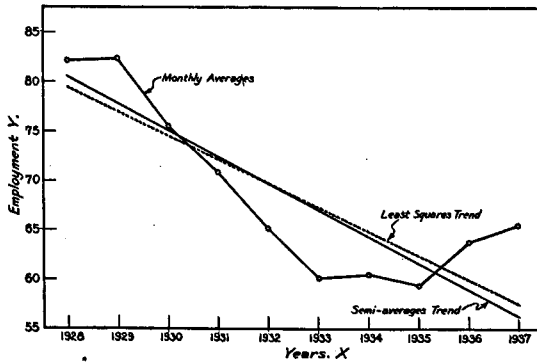


Fig. 33.—Linear Trends of Employment Fitted by Mathematical Means. (Data: see Table XIV.)

TABLE XIV
EMPLOYMENT IN FIRM T

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Monthly Average
1928	70	70	75	80	84	90	98	98	88	84	76	71	82.00
1929	70	70	80	85	90	95	95	95	86	80	73	68	82.25
1930	65	66	70	80	80	84	87	88	82	75	67	61	75.42
1931	61	66	72	74	76	78	80	80	75	70	61	58	70.93
1932	56	58	61	64	68	72	74	75	72	67	60	53	65.00
1933	53	55	57	59	63	66	68	68	65	62	54	50	60.00
1934	47	50	57	60	63	69	70	70	67	63	58	50	60.33
1935	48	50	55	60	60	70	72	72	68	60	50	46	59.25
1936	48	53	57	63	70	74	75	74	70	65	60	50	63.25
1937	52	52	60	60	66	77	78	78	74	69	60	60	65.50
Total	570	590	644	685	720	775	797	798	747	695	619	567	683.93

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EXAMPLE 27

SEMI-AVERAGES TREND OF EMPLOYMENT

Data: Monthly averages of employment for Firm T (see Table XIV).

First Half		Second Half	
Year	Employment	Year	Employment
1928	82.00	1933	60.00
1929	82.25	1934	60.33
1930	75.42	1935	59.25
1931	70.93	1936	63.25
1932	65.00	1937	65.50
Total	375.60	Total	308.33
<i>M</i> (Mid-1930)	75.12	<i>M</i> (Mid-1935)	61.67

$$\text{Measure of slope, } b = \frac{(75.12 - 61.67)}{5} = -2.69 \text{ per year}$$

EXAMPLE 28

LEAST SQUARES STRAIGHT-LINE TREND OF EMPLOYMENT

Data: Monthly averages of employment for Firm T (see Table XIV).

Year	Monthly Average	Years Centered (Half Year Units)		
<i>X</i>	<i>Y</i>	<i>z</i>	<i>z</i> ²	<i>zY</i>
1928	82.00	-9	81	-738.00
1929	82.25	-7	49	-575.75
1930	75.42	-5	25	-377.10
1931	70.93	-3	9	-212.79
1932	65.00	-1	1	-65.00
1933	60.00	1	1	-60.00
1934	60.33	3	9	180.99
1935	59.25	5	25	296.25
1936	63.25	7	49	442.75
1937	65.50	9	81	589.50
Totals	683.92	0	330	-399.15

$$a = \frac{\Sigma Y}{N} = \frac{683.92}{10} = 68.392 \text{ (Dec. 31, 1932, when } z = 0)$$

$$b = \frac{\Sigma zY}{\Sigma z^2} = \frac{-399.15}{330} = -1.2095 \text{ (per half year)}$$

$$T = a + bz = 68.392 + (-1.2095z)$$

The trend:

$$\text{In 1928, } z = -9, \text{ and } T = 68.392 + (-1.2095 \times -9) = 79.2785$$

$$\text{In 1937, } z = 9, \text{ and } T = 68.392 + (-1.2095 \times 9) = 57.5075$$

cated linear trend for the same purpose may be fitted by the method of semi-averages, which divides the data into two equal time periods, discovers the average for each period, and fits a straight line running through these two averages, which are plotted at the mid-point of each of the two time periods. Such a trend for the data of Table XIV is illustrated in Figure 33, and the method of calculation is summarized in Example 27.

It may be desired to state the trend in equation form, just as the regressions described in Chapter VIII have been defined, although such description is chiefly useful when intensive further analysis is to be undertaken. Then, it may be worth while to fit the more complicated *least-squares* linear trend in which values of a and b are discovered by somewhat involved mathematical procedures. Details of the process cannot be described here, but Example 28 illustrates the method involved. The only feature that is distinctly different from similar aspects of correlation analysis is the centering of the time units. If the series involves an odd number of years, years may be used as units, with the central year as zero. If the series is even in number, the half-year units illustrated in the example are more convenient. When values of a and b have been discovered and inserted in the trend equation, the trend value for any year may be secured simply by inserting its x -value in the equation. The least squares trend has been included in Figure 33.

Measurement of seasonal fluctuations. Over a long period of years, including both prosperity and depression, the most important cause of unemployment is seasonal fluctuations in business, and the most important type of unemployment numerically, both in terms of the number of workers involved and of the number of days of idleness occasioned, is seasonal.¹

¹See, Saunders, Christopher, *Seasonal Variations in Employment*, New York, Longmans, Green & Company, 1936; Bursk, J. P., *Seasonal Variations in Employment in Manufacturing Industries, a statistical study based on census data*, Philadelphia, University of Pennsylvania Press, 1931.

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For industry as a whole, as has been indicated, January is the month of least employment, and October is that at which employment is greatest. But, while this condition is true of business as a whole, it does not feature individual businesses nor particular departments and divisions, which have their own distinctive seasonality. From the standpoint of the personnel interest in stabilizing employment, these individual seasonalities are highly important, both because they must be recognized if steps are to be taken to counteract them and thus to reduce seasonality, and because they may frequently be advantageously combined in some sort of dovetailing arrangement.

The findings of the Minnesota Employment Stabilization Institute as to the types of seasonality in Minneapolis ef-

TABLE XV^a
TYPES OF SEASONALITY IN MINNEAPOLIS, SHOWING THE PERCENTAGE OF FIRMS AND EMPLOYEES AFFECTED

Type of Seasonality	Percentage of All Seasonal Firms	Percentage of Employees in Seasonal Firms	Amplitude of Fluctuation
Spring ^b	3	0.7	9
Public utilities and railroads.....	9	58	21
Summer (Other than public utilities and railroads).....	43	18	16
Early Fall.....	12	10	15
Pre-Christmas.....	9	2	16
Winter.....	9	5	20
Spring and Pre-Christmas.....	12	6	13
Spring and Fall ^c	3	0.3	33
Total.....	100 ^d	100	
Weighted Average ^e			19

^a Only one firm in the sample had this type of seasonal peak. In order not to reveal the identity of the firm, the fluctuation in employment is not presented in a chart.

^b Thirty-three firms or 42.8 per cent of the 77 firms from Minneapolis included in this study were considered seasonal.

^c The weights used in obtaining this average were the number of employees in each seasonal group.

^d Sogge, T. M., *Seasonal Irregularity of Employment in Minneapolis, St. Paul, and Duluth*, p. 7. Minneapolis: University of Minnesota Press, November, 1931.

fectively illustrate this condition. The Institute found that, in this area, 43 per cent of the firms in which a seasonal influence in employment was important had their peak of employment in the summer. Twelve per cent had an early fall peak, and another 12 per cent were peaked at the holiday season. In Duluth, the percentages were distinctly different, as is shown by Tables XV and XVI, which compare these conditions.

What is desirable, therefore, as a basis for possible control of fluctuations and for effecting combinations of industries and divisions whose seasonal peaks are complementary, is the discovery and measurement of these seasonal variations. In effect, this result necessitates the determination of the typical or average position for each month of the year, a measure to be gained only by analysis of the data for a number of years.

This result may, if seasonality is regular and pronounced,

TABLE XVI
TYPES OF SEASONALITY IN DULUTH SHOWING THE PERCENTAGE OF FIRMS AND EMPLOYEES AFFECTED

Type of Seasonality	Percentage of All Seasonal Firms	Percentage of Employees in Seasonal Firms	Amplitude of Fluctuation
Spring.....	6	2	70
Public utilities and railroads...	13	36	23
Summer (Other than public utilities and railroads).....	22	15	42
Summer-Fall.....	10	8	31
Fall.....	20	13	74
Winter.....	13	6	33
Spring and Fall.....	6	5	46
Spring and Pre-Christmas ^a	3	2	54
Summer and Winter.....	7	13	511
Total.....	100 ^b	100	
Weighted Average.....			99

^a Since there is only one firm in this type of fluctuation, no chart is given.
^b Thirty-one firms or 44 per cent of the 70 firms included in this study exhibited seasonality.

^c *Ibid.*, p. 15.

be approximated by charting the actual fluctuations for a number of years on individual sheets of transparent paper and merely placing one sheet above the other in such a manner that the lines are, in effect, superimposed upon each other. Within individual years, the positions of various months may be conveniently indicated by dots or small circles, and the series may be connected by a line running from one month to the next. Charts for individual years may then be raised or lowered, to take account of trend or cyclical fluctuations, and the seasonal pattern, if there is one, may be readily noted.

Such a graphic approach does not, however, provide any measurement of seasonal variation, and if a definite measure of usual monthly levels, a seasonal index, is desired, more complicated analysis is essential. The desirability of securing a series of seasonal indexes for employment as a whole and for that of various departments will depend upon the purposes of analysis. If it is desired merely to recognize clearly the usual pattern of seasonality within such groups of employees, the graphic representations will prove entirely adequate. If, on the other hand, it is desired to remove the seasonal influences so that other factors conditioning employment fluctuations may be more apparent, then it is essential that seasonal indexes be provided for that purpose. Further, comparisons of seasonality among various departments or between the individual firm and the industry as a whole are facilitated by the use of such indexes.

There are a number of methods that may be used to secure indexes of seasonality. One of the most commonly used involves the calculation of moving averages (usually 12-month averages are utilized), the expression of original data as ratios to these averages, and the selection of median or average ratios as seasonal relatives. That procedure is entirely too extended to be included in this description. A much simpler method merely calculates the average employment for each month throughout the entire series, corrects this average for the trend in the data, totals the cor-

rected averages, and expresses each month as a ratio to the average of all months. That procedure, usually described as the simple average method, is illustrated in Example 29. The only step in the procedure that may give rise to question is the correction for trend. It is necessary, of course, that the trend be measured first. Then, since the trend is generally calculated as of the mid-year, that is, June 30, June and July will vary from the annual trend by one twenty-fourth each, and other months will require adjustment as indicated. If, as in the example, the slope of the trend is negative, the raw data of months in the latter half of the year will be depressed and their averages must be increased, while those of the earlier months require adjustment downward to place all on a comparable basis.

EXAMPLE 29

SEASONAL INDEXES BY THE SIMPLE AVERAGE METHOD

Data: Employment in Firm T (see Table XIV). Least squares linear trend from Example 28, $b = -2.419$ (per year).

Month I	Total II	Average III	Trend Addition IV	Corrected Average V	Indexes VI
January	570	57.0	+11/24 = -1.10	55.90	81.9
February	590	59.0	+ 9/24 = - .91	58.09	85.1
March	644	64.4	+ 7/24 = - .75	63.65	93.2
April	685	68.5	+ 5/24 = - .51	67.99	99.5
May	720	72.0	+ 3/24 = - .32	71.68	104.8
June	775	77.5	+ 1/24 = - .11	77.39	118.1
July	797	79.7	- 1/24 = + .11	79.81	116.8
August	798	79.8	- 3/24 = + .32	80.12	117.2
September	747	74.7	- 5/24 = + .51	75.21	110.1
October	695	69.5	- 7/24 = + .75	70.25	102.8
November	619	61.9	- 9/24 = + .91	62.81	90.5
December	567	56.7	-11/24 = +1.10	57.80	84.5
Totals	8207	820.7	.....	820.70	1200.0 (Check)
Average of Averages				68.392	

Another frequently used method calculates seasonal indexes as medial link relatives. In that procedure, illustrated in Example 30, the data for each month after the first are expressed as ratios of each preceding month. The

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EXAMPLE 30
SEASONAL INDEXES AS MEDIAN LINK RELATIVES

Data: See Example 29.

LINK RELATIVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1929	...	100.0	107.2	106.8	106.2	107.1	108.9	100.0	90.7	95.5	90.5	93.4
1930	98.6	100.0	114.3	106.2	105.9	105.5	100.0	100.0	90.6	93.2	91.3	93.2
1931	95.6	101.7	106.0	114.2	100.0	105.0	103.6	101.1	93.2	91.5	89.4	91.0
1932	100.0	103.7	109.0	102.8	102.7	102.6	102.6	100.0	93.8	93.4	87.2	95.1
1933	96.6	103.7	105.1	105.0	106.3	103.0	102.9	101.3	96.0	93.1	89.6	83.4
1934	100.0	103.8	103.6	103.5	106.8	104.8	103.0	100.0	95.6	95.5	87.2	92.7
1935	94.0	106.5	114.0	105.2	105.0	109.6	101.3	100.0	95.8	94.0	92.2	86.3
1936	96.0	104.2	110.0	109.1	100.0	116.7	102.8	100.0	94.5	88.3	83.4	92.0
1937	104.3	110.4	107.6	110.5	111.0	105.8	101.2	98.7	94.6	92.9	92.4	83.3
1938	104.0	100.0	115.4	100.0	110.0	116.8	101.2	100.0	94.8	93.3	87.0	100.0
Medians	98.6	103.7	108.4	105.7	106.1	106.5	102.7	100.0	94.6	93.4	89.5	92.5

Month	Median Link Relatives	Chain Relatives	Trend Adjustment (to be subtracted)	Index Base = Jan.	Index Base = Avg. Mo.
January	98.6	100.0	.000	100.000	83.5
February	103.7	103.7	-.067	103.767	86.5
March	108.4	112.4	-.134	112.534	94.0
April	105.7	118.8	-.201	120.001	100.2
May	106.1	126.0	-.268	126.268	105.5
June	106.5	134.2	-.357	134.557	112.3
July	102.7	137.8	-.402	138.202	115.2
August	100.0	137.8	-.469	138.269	115.3
September	94.6	130.5	-.536	131.036	109.3
October	93.4	121.8	-.603	122.403	102.2
November	89.5	109.0	-.670	109.670	91.4
December	92.5	100.8	-.737	101.537	84.6
January	98.6	99.2	...	...	...
Totals	...	...	...	1438.244	1200.0 (Check)
Average	...	...	...	119.853	...

Trend = 99.2 - 100 = -.8

Trend adjustment = 1/12 x -.8 = -.067

median link relatives for each month are noted, and the first of them, that of January, is expressed as 100. The median for each succeeding month is then expressed as a percentage of the preceding one, and January is expressed as a

percentage of December. The difference between the two values for January thus obtained is regarded as the measure of trend, and the chain relatives are adjusted for trend by subtracting $\frac{1}{12}$ of that difference from the February relative, $\frac{1}{12}$ from that of March, and so on through the months. The result is an index based on January as 100. If it is desired to place the index on a base representing the average of all months, that result is obtained by dividing the series by its average, as shown in the example.

Numerous other methods of measuring seasonality are available if, for any reason, those described can not be used. In one of them, seasonality is measured as a ratio of individual months to trend values, and there are numerous other variations. For most purposes, however, the methods described will be found entirely satisfactory. What is important, of course, is that some method be utilized that takes account of trend in the data and, recognizing this influence, then expresses the relative positions of individual months. Any method that achieves this result may be regarded as satisfactory.

Cyclical influences. Data may be corrected for seasonal influences by dividing them by appropriate seasonal indexes. In formula form, $Y/S =$ seasonally corrected data. Similarly, they may be corrected for trend by dividing seasonally corrected items by the measure of trend. Data so corrected may be said to represent cyclical percentages ($C\% = Y/ST$). They thus provide a measure of the cyclical influence. Thus, if, in the case of the illustrative data used in preceding paragraphs, the monthly employment for December, 1930, when 61 men were employed, is corrected for seasonality by dividing it by the seasonal index for December (the simple average index is used), $S = 84.5$, then the seasonally corrected item appears as

$$\frac{Y}{S} = \frac{61}{84.5} = 72.2$$

It means that, since December employment is typically

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84.5 per cent of the average month, if this seasonal influence were removed, the level would be increased to approximately 72.2. The trend value for this month is, however, 74.5 (least squares linear trend), a figure which means that, according to this trend, the given month should have had an employment, corrected for seasonal influences, of approximately 74.5 men. The seasonally corrected figure may now be corrected for this trend so that it becomes

$$C\% = \frac{72.2}{74.5} = 0.97$$

or the same result may be obtained by dividing the raw data by the product of the seasonal index and the trend figure. It indicates that the month actually shows 97 per cent of the employment to be expected in terms of the measured trend and seasonal influences. It suggests that a cyclical or residual factor has exerted a negative effect upon the situation.

Generally, employment analysis does not place great emphasis on corrections for seasonal and trend, being much more interested in trend movements and seasonal variability in and of themselves. The significance of cyclical change can be adequately evaluated in most cases by charting, without careful measurement and comparison with data corrected for seasonal and trend. On the other hand, the fact that cyclical factors are highly important in occasioning instability cannot be questioned, as is clearly evidenced from the estimates of unemployment shown in Figure 31, page 423. In its efforts to gauge the significance of the cyclical factor, the University of Minnesota Employment Stabilization Institute found that cyclical influences occasioned a decline in employment for all industries amounting to 21.4 per cent in the years from 1929 to 1931.

Technological change. In some firms, and at certain times in almost all firms, technological change displaces employees. No accurate measurement of this displacement is available, partly because it is not clearly identified in em-

ployment records. The problem involved is a serious one, however, both because the condition occasions an undesirable feeling of insecurity among employees and because displaced workers represent a highly undesirable by-product of industry. Their problem is a serious one in spite of the fact that the vast majority of them find suitable and profitable employment in other occupations.¹⁰ That they do find such employment is clearly evidenced in census reports of the proportions of the total population gainfully employed at various census periods. Some of the most pertinent of these data are summarized in Table XVII.

TABLE XVII
 PERCENTAGE OF PERSONS TEN YEARS AND OVER GAINFULLY
 OCCUPIED IN THE UNITED STATES, 1880-1930

Census Year	% Both Sexes
1880	34.7
1890	37.2
1900	38.3
1910	41.5
1920	39.4
1930	39.8

On the other hand, it appears clearly that, in many industries, capital goods substitute for rather than supplement labor, and it is also clear that this tendency is strengthened in its effects by extensive cyclical fluctuations. Consequently, the problem of technological change is, from a social viewpoint, distinctly serious.¹¹

¹⁰ Lubin, Isador, "Absorption of the Unemployed by American Industry," Washington, The Brookings Institution, 1929; Stern, Boris, "Technological Change as a Factor in Unemployment," *Journal of the American Statistical Association*, Supplement 27 (177A), March, 1932, p. 73-75; Woytinsky, Vladimir, *Three Sources of Unemployment*, Geneva, International Labor Office, 1935; and *Duration of Unemployment of Workers Seeking Reemployment*, Lansing, Mich. State Emergency Relief Commission, 1937.

¹¹ See, Lescobier, D. D., "What is the Effect and Extent of Technical Changes on Employment Security?" New York, American Management Association, Personnel Series, No. 1, 1930; Lumpkin, Katherine D., *Shutdown in the Connecticut Valley*, Northampton, Mass., Smith College Studies in History, Vol. XIX, No. 3-4, 1936.

Technological change exerts a varying influence in different industries. Its effects are difficult to measure, because changes in employment in specific industries reflect many other influences, including, as particularly important, what may be described as cultural change, in which human wants vary and their shifts are directly reflected in employment. Thus, player pianos have given way to phonographs, and the latter, to a considerable extent, have been replaced by radios. Similarly, tastes in transportation, in amusement and recreation, and in numerous other important aspects of consumption are undergoing constant change.

Some conception of the significance of technological and cultural changes as they affect employment may, however, be gained from a comparison of the importance of various industries as sources of employment at different census periods. Thus, in 1870, agriculture, lumbering, and fishing accounted for 53.85 per cent of the gainfully employed. By 1930, these industries provided employment for only 21.96 per cent of all gainful workers. Meanwhile, manufacturing and mechanical industries were growing from 21.24 per cent in 1870 to 28.90 per cent in 1930. Trade and transportation increased their proportions of gainfully employed from 10.42 per cent in 1870 to 28.5 per cent in 1930, and professional services accounted for 6.02 per cent in 1930, compared with 2.93 per cent in 1870. Mining increased its proportions from 1.36 per cent to 2.01 per cent, while domestic and personal service showed a slight increase, from 10.20 per cent to 12.54 per cent.¹²

Conclusion. By means such as those described in this chapter, it is possible for management to obtain a clear-cut portrayal of the instability of employment as a whole and of that in particular divisions, departments, plants, and occupations. The significance of different types of unemployment may be adequately evaluated as a basis for whatever stabilization measures may appear appropriate. Only when

¹² *Machinery, Employment, and Purchasing Power*, pp. 26-45. New York: National Industrial Conference Board, 1935.

the conditions affecting employment are so recognized can an effective program for stabilization be planned.

Thus, in the case of Firm T, used as an illustration throughout the chapter, certain conclusions are apparent from even the limited data that can be conveniently manipulated in an example. The problem of seasonality is clearly defined, and its significance throughout the years is evidenced by the wide range of seasonal indexes. Moreover, the downward trend is certainly significant, or rather it would be so were data presented for a more extensive number of years. If available data for a twenty-year period were analyzed, it would show, also, how serious was the fluctuation introduced by the cyclical factor.

Individual firms show wide variations in the problems they face. In some, particularly capital goods producers, seasonal fluctuations appear to be of slight importance, while cyclical fluctuations are particularly serious. In others, notably consumption goods industries, cyclical influence is comparatively small, while seasonal fluctuation extends over a wide range. Within the business, particular divisions and branches and individual occupations may show not only distinctive seasonal patterns but highly significant trends as well. Only an extensive analysis of seasonal, cyclical, and trend influences in a variety of businesses and occupations could possibly illustrate the wide range of combinations in the conditions that give rise to instability. Alert management, however, must be cognizant of the influences these factors exert on employment among all groups of employees, to the end that steps may be taken to overcome their adverse influences.

Exercises and Problems

1. Prepare a classification of the most common causes of unemployment or employment instability, indicating the methods of isolating and measuring each of them.
2. Analyze the data tabulated below, representing monthly employment in one department of a large manufacturing firm, by
 - (a) Fitting linear trends by freehand, semi-averages, and least squares methods. Chart them.

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- (b) Discovering indexes of seasonality by simple averages and median link relative methods.
- (c) Correcting the data for the last year for trend and seasonality and measuring cyclical percentages.

Month	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
Jan.	15	20	17	22	25	30	31	28	34	33
Feb.	20	25	18	25	30	30	37	33	38	35
Mar.	25	30	23	28	35	33	35	37	38	36
Apr.	20	25	25	28	31	30	28	35	35	30
May	10	20	27	25	28	29	23	30	31	25
June	15	15	21	20	23	23	20	25	28	25
July	15	20	17	15	22	23	20	22	28	27
Aug.	20	25	20	18	25	27	23	28	30	28
Sept.	25	30	23	22	32	30	25	34	35	30
Oct.	30	30	28	28	36	35	27	38	37	31
Nov.	30	25	23	25	35	35	30	38	36	31
Dec.	25	20	22	25	30	32	28	35	34	25

3. Apply the same type of analysis as has been described in the preceding exercise to the following data of actual employment in a large concern:

Month	1926	1927	1928	1929	1930	1931	1932
Jan.	1141	1123	1124	1216	1069	894	487
Feb.	1180	1172	1162	1255	1186	899	536
Mar.	1237	1188	1217	1298	1306	872	530
Apr.	1303	1278	1291	1341	1328	828	495
May	1353	1293	1351	1377	1206	886	478
June	1337	1305	1364	1370	1103	668	442
July	1313	1257	1325	1343	1103	596	439
Aug.	1261	1214	1297	1316	1022	552	420
Sept.	1196	1167	1257	1005	973	543	407
Oct.	1133	1140	1210	980	881	537	392
Nov.	1082	1108	1207	963	854	452	367
Dec.	1102	1103	1201	990	848	372	342

Collateral Reading

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CHAPTER XIX

Employment Stabilization

THE steps that may be taken by management to stabilize employment are closely related to the causes of unemployment described in the preceding chapter. A first step is the recognition and measurement of factors contributing to instability. Once they have been identified, the stabilization program may be adapted to their control.

As suggested in the preceding chapter, there are several types of unemployment. A small part of such instability is attributable to personal characteristics of workers. Much more important are seasonal factors, and others that are significant include cultural and technological changes, and cyclical booms and recessions. All contribute to unemployment under certain circumstances, and attention should, therefore, be given to devices that may be used to control or counteract each of them, as well as to some measures of general application to all types of instability.

Reducing personal unemployment. The Census of 1930 found some 0.35 per cent of the population unemployed on account of personal conditions and characteristics. Most important of such features was ill health, but many individuals were handicapped by physical disabilities or by temperamental, emotional, and related features.

Stabilizing employment among individuals so afflicted is largely a matter of individual adjustment on the part of both employers and employees. In the larger business organizations, there are usually a limited number of positions that can be adequately filled by such persons, and many firms make a practice of caring for a few handicapped individuals, both because they feel that they are performing a

real public service and because such individuals are frequently hired at reduced rates.

Very large business organizations may afford the services of a psychiatrist and of properly trained psychiatric social workers, and the latter will be able to effect a large number of satisfactory readjustments. In some cases, where individual employees are found unsuited to their jobs, a carefully planned program of retraining within the organization, by means of which they may be prepared for other types of work, may be found effective.

Smaller firms cannot effect readjustments so readily. The services of psychiatrists and psychiatric social workers are not generally available to them, and misfits must be dealt with directly by management. A great amount of common sense and a maximum of human understanding will be useful in such cases, but they cannot take the place of expert services, and it is to be hoped and reasonably expected that there will be public provision of such services in the not too distant future. A tendency in that direction is apparent in the expansion of public facilities for vocational rehabilitation which has been advanced by the provisions of the Social Security Act of 1935. Earlier laws, beginning with the federal Vocational Rehabilitation Act of June 2, 1920, which has been amended four times, were made additionally effective by Social Security provisions which increased federal aid to the states to a total of \$1,938,000 annually. Forty-five states now have definite programs of vocational rehabilitation, and some 38,000 persons received attention in these programs in 1936. Meanwhile, however, management must probably protect itself against too many problem cases of this kind by giving increasingly careful attention to its activities in selection and placement.

In dealing with unadjusted and misplaced employees, it must always be remembered that, whether management is or is not directly responsible for the condition, the fact is that it allowed the placement to be made and that it should have been much better able to judge the propriety of that

placement than should the individual involved. Moreover, the public will generally tend to hold management responsible, and public opinion will not fail to criticize a management that does not reduce this type of unemployment to a minimum.¹

Seasonal fluctuations. It has been said that seasonal fluctuation in business and industry is the most important cause of unemployment. It may also be said that management has had greater success in devising means of reducing seasonality in employment than in its attacks on other types of instability. Numerous techniques have been conceived and used both regularly and experimentally.² A study undertaken under the auspices of the Minnesota Employment Stabilization Institute has described these devices in some detail. From that and other similar studies, several fairly important types of devices may be distinguished. Among the most important are:

1. Stimulating slack season sales.
2. Securing advance orders.
3. Diversification and dovetailing.
4. Scheduling production.
5. Production for stock.
6. Spreading work.
7. Developing new markets.
8. Changing custom.

Each of these types of device deserves description.

Stimulating slack season sales. By stimulating sales in what would ordinarily be slack seasons, many firms have found it possible to build up the low points in annual em-

¹ See, Squires, B. M., "Stabilizing Production and Employment," *Society of Industrial Engineers Bulletin*, January, 1931, Vol. 13, No. 1, pp. 2-12.

² See, Sogge, T. M., "Seasonal Irregularity of Employment," Minneapolis, University of Minnesota Press, 1931; Smith, E. S., *Reducing Seasonal Employment*, New York, McGraw-Hill Book Company, Inc., 1931; *Company Plans for the Regularization of Plant Operation and Employment*, *Company Plans for Unemployment Insurance*, 1930, and *Selected Bibliography, Industrial Plans for the Regularization of Employment*, 1931, Princeton, N. J., Industrial Relations Section, Princeton University.

ployment. The Aberthaw Company, the General Electric Company, Armour and Company, Hart Schaffner and Marx, the R.C.A. Victor Company, and the Minneapolis Honeywell Regulator Company are among prominent concerns that have utilized various devices operating in this direction. Special advertising campaigns, the emphasis of seasonally attractive goods, higher sales commissions in slack periods, sales contests, introduction of novelties and specialties in dull seasons, provision of premiums and discounts for customers, and other similar devices are among those most frequently used.

There are, of course, limitations on the use of these techniques. While it is perfectly possible, for instance, for R.C.A. Victor to produce portable phonographs and thus to stimulate business in summer, usually a slack season, and while others of the special arrangements may be found useful in particular situations, for many businesses these adjustments mean increased production and selling costs, impossible under highly competitive conditions. At the same time, emphasis placed on buying in slack seasons may readily encourage dealers to purchase more than they can dispose of, thus overstocking and adversely affecting sales in normally good seasons.

Securing advance orders. The same general objections may be made to attempts to get purchasers to order in advance of their need. In addition, the concessions made to encourage customers to buy early may cause them to regard the usual price as unreasonable, and, of course, if style is an important characteristic, then customers would be taking serious chances in ordering before prevailing style features were fully evident.

Nevertheless, many firms have found it possible to stimulate employment in slack periods by use of various schemes which encourage customers to order early. Possibly the simplest is that in which credit is extended and accounts are not billed until well past the usual purchase time. In other cases, delayed billing is accompanied by provisions for spe-

cial discounts on earlier payments. Among concerns that have utilized this arrangement are the Patterson-Sargent Company (paints), Remington Arms Company, Chas. M. Higgins Company (ink), and the Goodyear Tire and Rubber Company.

Other devices that have been found effective in securing advance orders include special discounts applying before specified dates (American Cast Iron Pipe Company, W.F. Hall Printing Company), guaranteed delivery dates (Denison Manufacturing Company), and lower prices based on earlier contracts with processors of raw materials (Hickey-Freeman Company, makers of men's clothes).

Diversification. No device has received more extensive attention from employers of all kinds than that of dovetailing and diversification of products. It has long been recognized as what appears theoretically to be the ideal means of avoiding peaks and slumps in production and employment, and the classic illustration of the producer who supplemented his manufacture of refrigerators with the production of furnaces is widely recognized and quoted. Many such combinations have been made. Smith, in the study to which reference was made at the outset of this discussion, reports that a manufacturer of men's clothing found children's coats an excellent filler for otherwise dull summer months (The Printz-Biderman Company). He mentions, also, a woodworking concern (George W. Smith Woodworking Company) that supplements its usual millwork with special production of wooden parts for other manufacturers. Another millwork concern supplements usual spring and summer busy seasons by production of games for the Christmas trade. One of the most effective diversification arrangements is that of the Crosley Radio Corporation. Originally, this concern devoted its entire attention to the production of radio receivers. Then it developed electric refrigerators, a product with a distinctly different seasonal demand. More recently, it has added electric washing and ironing machines, bottle coolers, room heaters, and an elec-

tric hair-growing machine. Many other illustrations of diversification of products might be cited, of which some of the most interesting are the production of paper caps and steel buildings by the White Castle System, Inc. (venders of hamburgers), the building of stainless steel trains, trailers, and airplane bodies by the Edward G. Budd Manufacturing Company, and the creation of such varied glass products as glass bricks, building insulation, air filters, and glass cloth by Owens-Illinois Glass Co., and by Libbey-Owens-Ford Glass Company.³ Numerous other examples of successful supplements for a seasonal product might be cited, but all involve essentially similar features.

Chief limitations upon this practice arise out of the difficulty of adapting employees and productive equipment to the different products. It is not easy to find products with different seasonal demands which require the same skills on the part of workers. Neither is it possible, in many cases, to find products with opposed seasonal characteristics that can be produced with the same or similar machines and productive equipment.

Scheduled production. An almost equally widely proposed means of smoothing seasonal irregularities is that involving the coordination of sales and production, to the end that the latter may be scheduled on an orderly basis. In essence, the plan involves the careful estimation of the full year's output and its even distribution throughout the year. To that end, salesmen are encouraged to schedule sales on a monthly quota basis. They are instructed not to oversell customers at any time but rather to regularize sales. In some cases, careful analysis is made of each customer's account to determine what his average weekly or monthly demand may be. On the basis of such analysis annual production plans are made, and monthly schedules calculated to effect the desired total by continual and regularized production are placed in operation. Thereafter, inventories are

³"The Profits of Diversification," *Business Week*, May 29, 1937, pp. 35-42.

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⁸ "The Profits of Diversification," *Business Week*, May 29, 1937, pp. 35-42.

carefully observed to see that both distribution and production are proceeding according to schedule.

Probably the most widely known of such plans is that of the Proctor and Gamble Company, by means of which it has been possible for the management to guarantee a regularized year of 48 weeks' employment to all workers. The Eastman Kodak Company has also found the plan effective.

This method of stabilization is limited as to its possible application. It is not useful where products are subject to deterioration or rapid change of style. It is particularly appropriate where actual consumer demand is fairly constant (as is the case with soap) and where irregularities in sales have been largely attributable to methods of selling. It requires a high degree of uniformity in the form of the product and a minimum of special types, styles, and methods of merchandising.

Producing for stock. Production for stock, by means of which goods are produced evenly throughout the year for a demand that is quite seasonal, with excesses in production over sales being stored in warehouses, is another well-established stabilization device. Many concerns have found it entirely satisfactory, including the Gruen Watch Makers Guild, the Barrett-Cravens Company, and Hills Brothers, food importers. The first of these firms deals with a market in which 50 per cent of sales occur in 4 months of the year. Yet, by producing for stock, management has provided seasonally stable employment for some 2,800 men over a period extending back a quarter of a century. Hills Brothers, having installed refrigerated warehouses, stabilized the employment of workers who prepare dates for the market, in spite of the varying demand, so highly seasonal that employment previously fluctuated from 1,100 to 200 workers, from peak month to the seasonal low period.

As in the case of advance scheduling, however, this device is of distinctly limited application. Products must be highly uniform and not subject to rapid style changes. The de-

vice requires extensive outlays of capital, and, for many concerns, it requires credit resources beyond those which they can secure. In a period of falling prices, the practice is especially hazardous, for inventories may be acquired at costs far above those of current production. For this reason, manufacturing for stock tends to be restricted in periods of business recession, when its absence is likely to be most seriously felt.

Spreading employment. Many concerns feel that it is fairer to all employees to spread available employment among them rather than to allow a high degree of stability to feature certain groups while the employment of others is unstable. On this account, they spread existing employment among employees. This result may be most simply attained by providing a flexible length of working day or week. Such arrangements are possible, however, only where all employees are able to adapt themselves to shifts among different tasks, a condition not generally characteristic of business and industry. The plan has been found useful by the Delaware and Hudson Railroad, where the length of the working day is varied, and by a number of other concerns which utilize an adjustable work week.

It appears, however, that many aspects of the work-spreading arrangement may be elusive and unrecognized, and it is likely that the device is not so useful as is popularly believed. Most discussions appear to assume that hours or days may be varied at will without significant effects on productive efficiency. This may or may not be the case, however, as many concerns have discovered. Reducing hours, for instance, may result in much less efficient production, which, if conditions are at all competitive, management cannot afford. In other instances, this change may greatly increase efficiency, as was discovered by one concern which reduced hours to avoid mounting inventories and found them growing more rapidly than ever after the change.

Moreover, the device may occasion serious disruptions in employee morale which are apt to be reflected in attendance and tardiness records. All such considerations must be taken into account.

New markets. Several concerns have found it possible to stabilize employment, as far as seasonal fluctuations are concerned, by discovering and developing new markets in which seasonal demand differs from that encountered among established outlets. South American markets are frequently especially valuable in this connection, since the seasons there are opposed to those in this country. Similar differences may, however, be found within the nation, as has been demonstrated by the A. C. Johnson Company. This concern, manufacturing floor wax and polishes, found that the significant seasonal expansion attendant upon house cleaning is quite different in northern and southern sections of the United States. By marketing in both, seasonal fluctuations were effectively balanced.

Changing custom. It has been widely recognized that, while climatic change from hot to cold weather and from moist to dry seasons is a basic cause of seasonal fluctuation in consumption and distribution, many such shifts are not directly related to climate but are rather the expression of customs associated with the seasons. Thus, for instance, gifts are most extensively purchased at Christmas time, automobile sales reach peaks in the spring, and numerous other seasonals are reflections of custom rather than of highly significant temperature or other climatic changes.

Many concerns and in some cases whole industries have recognized the fact that custom is probably much more important as a cause of seasonal fluctuation than is the actual change of seasons, and they have sought to change the habits of customers in order to stabilize consumption and thereby permit the stabilization of employment. The automobile industry, for instance, formerly accentuated spring buying habits by bringing out new models at that time. Since 1934, however, manufacturers have released their new mod-

els in the fall, and dealers have held their annual shows at that time, with the result that winter months, formerly featured by employment for only a few tool makers and maintenance workers, now exhibit fairly high levels of employment, and year-round production is much more stable than before. Increasing efforts are being made to break the hold of custom on building and construction, and many other industries are attempting similar reforms.⁴

Cultural and technological unemployment. Another important cause of fluctuations in employment is cultural change, that is, change in the buying, consuming, and producing habits of the people, of which one of the most important single aspects is that involving change in the technical processes of industry and business, generally described as technological change. Technological change has received considerable popular attention, but the larger part of all cultural change is apparently taken for granted and practically ignored. It is typified by shifts in fashions and styles, although it also includes numerous slower changes, illustrated by the gradual displacement of the player piano by the phonograph and the later shift to the radio as a source of home entertainment. In some cases, effects upon employment are immediately obvious, as was the case, for instance, when public interest in miniature golf courses suddenly flowered and as rapidly disappeared. In others, generally involving somewhat slower changes, the effects are not so spectacular but are equally important, as is illustrated by the gradual substitution of movies for the chautauqua, for lodges, and for performances in the opera houses of the early nineteen hundreds, or by the evident tendency to take more extensive motor trips to the exclusion of railroad excursions. In all such instances of cultural change,

⁴For descriptions of managerial devices designed to overcome seasonal fluctuations, see, Makepeace, Roger S., "Stabilizing Factory Employment," *Harvard Business Review*, January, 1932, Vol. 10, No. 2, pp. 241-256; Swift, Harold H., "Guaranteed Time in the Stockyards," *Survey*, November 1, 1931, Vol. 67, No. 3, pp. 121-126; *Layoff and Its Prevention*, New York, National Industrial Conference Board, 1930.

workers find the products they produce no longer in demand, so that unemployment is imminent.

Technological change, although probably responsible for considerably less unemployment, has received much more popular attention, probably because it is more obvious and generally more spectacular. Further, journalistic writers have discovered that it effectively captivates the popular imagination and have, therefore, found it profitable to write extensively of its ravages and its menace.

It should be understood that the evidence indicates clearly that while technological changes unquestionably occasion serious unemployment, such unemployment is predominantly temporary in nature, and the long-time effects of such changes have been to increase rather than to decrease the proportions employed in the population as a whole. Other eras have had technological change, many of them (typified by that in which the industrial revolution occurred) probably being featured by changes as striking as those of recent years. Yet the long-time trend is unmistakably toward the employment of increasing proportions of the population. This development is clearly shown in the census records of employment in the United States, as indicated in the preceding chapter. The slight recessions in 1920 and 1930 undoubtedly resulted, at least in part, from the business depressions characteristic of each of those years, and they also reflect the influence of more strict school attendance legislation, which forced increasing numbers of children out of employment.

It is more remarkable that these proportions continued to grow, when it is realized that these years saw a net addition to our own population of some 27 millions of immigrants, a large portion of them of employable ages. In spite of technological changes, employment was provided for an increasing proportion of the native population and of some 27 millions in addition.

The problem of instability arising from technological change must, therefore, be regarded as primarily one of aid-

ing employees to transfer from out-moded occupations to those for which there is a demand, and the problem occasioned by cultural change is essentially the same.

To some extent, it is possible to forestall extensive cultural and technological change by standardization, a process in which wide varieties of styles, cuts, and forms is avoided and a few staple types are substituted. Thus, in capital goods industries, threads on bolts and screws may be standardized, as may certain machine parts. Similarly, certain producers of consumers goods, notably clothing manufacturers, have refused to produce extremes in styles, preferring to avoid the fluctuations inherent in such production. The application of such standardization is obviously limited, however, in a society in which consumers are free to demand what they will. It is most effective only in a situation where dictatorial governments limit production and consumption to a few staple lines by official restrictions placed upon consumers' choices.

The most effective tool in dealing with the unemployment arising out of cultural and technological change is analysis of the trend of employment in various occupations. Such analysis may be confined to a single division or department, or it may include data with respect to many firms in which similar operatives are employed. It permits the forecasting of future employment so essential to rapid readjustment and re-employment, and these devices must bear the major responsibility for any effective attack on the problem. The essence of any sensible program must recognize the futility and undesirability of restricting technological change and must seek to forecast and be prepared for it.

When it is recognized that technological or cultural changes are likely to dispense with the need for certain types of workers, they should be warned of that condition. Management may then suggest possible means by which such workers may adapt themselves to different positions. To some extent, they may frequently be absorbed within the industry, since their knowledge and experience have given

them some acquaintance with other operations within it. In other cases, they may be encouraged and assisted in preparing themselves for transfer to other divisions or other industries, such retraining being accomplished, as far as possible, before their actual release from original positions.

To a large extent, the need for this type of retraining may be avoided by intelligent vocational guidance and placement based on the analysis of trends in occupations. It is obviously short-sighted to direct newcomers to the field into occupations soon to be outmoded. It is apparent, however, that the basic requirement in avoiding such placements and the problems they later occasion is an accurate forecast with respect to the future of various occupations. Such a forecast can be made only by careful analysis of existing trends, coupled, of course, with a knowledge of the nature of industrial processes involved.

Cyclical fluctuations. From the standpoint of management, employment instability arising out of cyclical fluctuations in business as a whole is least amenable to effective control. The causes of such instability are generally so far beyond the control of individual managements, since their causes arise principally out of world economic, financial, and monetary conditions, that management can do little either to forecast or to regulate cyclical fluctuations. About all that is possible, therefore, is to take such steps as may tend to hold the organization together, to the end that the losses from such a disruption may be minimized.

A variety of devices designed to meet this need have been utilized by numerous firms in the depression following 1929. In some cases, employees have been put to work at plant improvement, maintenance, and repair. In others, work-spreading arrangements have sought to divide available employment among all employees, to the end that none should be forced entirely out. Some firms have sought new outlets, outside affected areas, while others have experimented with new products of a nature such that they are demanded even under depression conditions. In many

cases employers have assumed responsibility for outright relief to unemployed workers, hoping thus to have them available when the recession came to an end.⁵

In minor recessions, such as that experienced in this country in 1924-25, many of these adjustments prove effective means of holding the organization together. In major depressions, however, few firms can afford to continue them throughout the entire phase of the cycle, and it must be admitted that management has developed no effective means of stabilizing employment in such periods. About the only devices that appear to offer any reasonable prospect in this direction are more general public provisions, such as unemployment insurance, which place major dependence upon the accumulation of reserve funds that may be drawn upon, in times of recession, to stimulate and maintain consumers' demands. Even these devices cannot be expected to exert much influence toward stabilization in producers and capital goods industries.

General measures. There are a number of measures or devices that may be used by management under almost any or all circumstances as means of stabilizing employment within the firm, and there are several principles to be observed that are of similarly broad application. Consideration of these devices and principles forms the remainder of this chapter.

Elementary among such principles is that which requires a centralized control of employment. Such a control permits the provision of a careful summary of each employee's interests, skills, and experience, so that when a worker is released from one division, he may be readily considered for

⁵ See, as descriptions of various devices for this purpose, "Industrial Guarantee and Relief Plans," *Industrial Relations*, January, 1931, Vol. 3, No. 1, pp. 17-19; *Outline of Industrial Policies and Practices in Time of Reduced Operation and Employment*, 1931, *Policies and Practices for the Stabilization of Employment in Retail Establishments*, 1931, and *Emergency and Permanent Policies of Spreading Work in Industrial Employment*, 1931, Washington, President's Emergency Committee for Employment; Sargent, Noel, *Company Plans to Reduce and Alleviate Unemployment*, New York, National Association of Manufacturers, October 9, 1930.

transfer to another. Many managements, lacking such facilities, find themselves releasing men in one division and employing different individuals in another. The resulting instability of employment is obvious.

Another basic principle requires that releases be systematized. In the interests of fairness, employee morale, and productive efficiency, it is necessary that some definite plan or principle with respect to lay-off and permanent release be clearly defined and understood by workers and management alike. Some firms have found seniority a satisfactory principle, while others base release on the needs and responsibilities of workers, and still other criteria may be found appropriate. Apparently, both the careful selection of such a guiding principle and its thorough interpretation to all personnel connected with the organization are important.

Many managements have found it worth while to establish and maintain close coöperative relationships with public employment services, where the latter are efficiently administered. In so doing, they assist in effecting a balance of labor supply and demand throughout the nation, and they are also frequently able to find other employment for workers about to be laid off.

The use of transfers has been suggested in an earlier paragraph. It is frequently possible, occasionally with slight retraining, to use workers displaced in one division in some other type of work. This flexibility is of increasing importance now that public unemployment insurance provisions penalize dismissals and reward stability, and it is facilitated by developing the versatility of employees. To this end, they may be encouraged to acquaint themselves with various jobs and to acquire experience in several positions.

A similar flexibility is advantageous in vacation policies. Increasing numbers of firms now provide vacations for all types of employees. By insisting upon flexibility in these arrangements, so that vacations may be granted when slack

periods appear, they may be used to increase stabilization throughout the year.

Maintaining demand. A number of techniques, some fairly widely used, attempt, insofar as they seek to do more than provide relief, to stabilize employment by maintaining consumption, in the hope that the support received therefrom will be reflected in increased employment. In several of these attempts, this objective is distinctly secondary, the primary purpose being the provision of assistance and relief to the unemployed.

One such arrangement guarantees employment for a minimum number of weeks each year. Best known of this type is the arrangement maintained by Proctor and Gamble by which employees are guaranteed 48 weeks of employment each year, but many other firms in meat packing, clothing, and other industries have such plans. Recently, there has been widespread discussion of some such arrangement for workers in the automobile industry. Generally, such plans are accompanied by some program by means of which distribution is also stabilized, although this is not necessarily the case. At the Hormel Packing Company pork plants, for instance,⁹ although weekly arrivals of hogs vary from 10,000 to 35,000 and weekly hours necessarily vary widely, pay checks are the same throughout the year, and the device has been found highly satisfactory.

Dismissal wages. Increasing interest is being shown in dismissal wage plans, under which each dismissed employee receives, either in lump sum or in a series of payments, a fairly large compensation. The idea is to provide support for the worker while he searches for another job. The practice has been widely used in several European nations, where it is legally compulsory for certain groups of workers.

More than fifty different laws in seven European nations

⁹ See, Van Ullisingen, Arthur, Jr., "Paid by the Year," *Factory Management and Maintenance*, August, 1935, p. 323ff. See, also, *Company Loans to Unemployed Workers*, Princeton, N. J., Industrial Relations Section, Princeton University, February, 1931.

contain this requirement, and eight Latin-American and two Far Eastern nations have experimented with such provisions.⁷ Generally, compensation is required in lieu of extensive notice of intended dismissal.

The device is said to have been introduced in the United States by the Delaware and Hudson Railroad in 1922. By 1934, 212 companies normally employing about 2½ million workers reported having used it. Sixty firms had compensated more than 80,000 employees, and total compensation was estimated at approximately 8½ million dollars. In some cases, compensation equalled two years' earnings, and individual workers were found to have received as much as \$3,000 in unusual cases. Meanwhile, a number of joint funds, provided for this purpose by employers and organizations of employees, are known to have been in operation, although no reliable information as to their extent is available.

Generally, such plans have been confined to larger organizations, and the industries in which they are most numerous include public utilities, department and other retail stores, financial institutions, and food processors. A majority of the plans (60.4 per cent) include all employees of the concerns making such provisions, and the remainder generally restrict the plans to office and supervisory employees.

Scales of compensation generally place major emphasis upon two characteristics of the individual workers, including (1) salary or wage, and (2) length of service. Several methods of combining these characteristics to determine the amount of compensation have been extensively utilized. In what appears to be most common, the dismissed employee is allotted 1 week's pay, at his most recent rate, for each year of service with the organization. Another commonly used arrangement distinguishes classes of service, and allots a specified number of weeks' wage as compensation for each

⁷Schwennig, G. T., "Dismissal Legislation in Latin American Countries," *American Federationist*, March, 1936, Vol. 43, No. 3, pp. 265-274; and Hawkins, E. D., "Dismissal Compensation in American Industry," *Monthly Labor Review*, November, 1934, pp. 1067-1077.

class. Thus, for the minimum service, up to 2 years, 2 weeks' wage is paid; for 2 to 5 years, 3 weeks'; for 6 to 10 years, 4 weeks'; for 11 to 15 years, 6 weeks', and for 16 to 20 years, 12 weeks'. Many more complicated means of calculating benefits are employed. One that is widely used is expressed in formula form as,

$$\text{D.C.} = \left[\frac{(\text{Age} - 15) \times \text{Years of Service}}{25} \right] \times \text{Weekly Wage}$$

Another, also quite satisfactory, calculates compensation as,

$$\text{D.C.} = \left[\frac{\frac{\text{Age}^2}{40^2} \times \text{Years of Service}^2}{8} + 2 \right] \times \text{Weekly Wage,}$$

with a maximum of 52 weeks' wage.

Specific arrangements as to accounting, method of payment, and other details of the plans vary widely. Most of them are apparently financed on a pay-as-you-go basis, with compensation charged to salary and wage accounts. While this practice is open to question, inasmuch as costs should probably be budgeted, there is no particular hazard such as characterizes similar accounting in providing for retirement or old-age pensions, since the amounts are comparatively small and no liability for payments over a long period of time is involved. On the other hand, it would appear desirable that provision be made for the problem that would arise should any extensive number of dismissals become necessary in a single year.

The question as to how dismissal compensation should be paid, whether in a lump sum or in a series of weekly or bi-weekly payments, is actively debated at the present time. Advocates of the lump payment plan argue that it dismisses and releases the worker, so that he may go elsewhere in search of employment, while, in their opinion, the other arrangement tends to "freeze" those who are dismissed in their present localities. On the other hand, the partisans of the divided payment plan insist that employees are likely

to use the lump payment unwisely, to dissipate it quickly, so that it does not tide the worker over until another job is found. They feel, therefore, that in such cases the dismissal compensation has failed in its major objective. At the present time, lump-sum payments appear to be the more common in this country, although a number of firms are trying out combination plans in which workers receive about half the total due them in a lump sum and the remainder in periodic payments.⁸

Managerial approval of dismissal compensation seems to have grown steadily in recent years. In the depression following 1929, it appeared that although several concerns had recently inaugurated such arrangements, none of the firms already practicing such compensation had discontinued it. More recently, it was given distinct impetus by the inclusion of dismissal compensation in an agreement entered into by 138 carriers and twenty railway labor organizations under the Emergency Transportation Act of 1933, which provides for consolidation to eliminate unnecessary duplication of railroad services and facilities. The agreement stipulates that employees who are permanently displaced in such consolidations shall be given their choice of "coördination allowances" that spread dismissal compensation over a period of several months and "separation allowances" that compensate in a lump sum.

Coördination allowances provide for the payment of benefits amounting to 60 per cent of average monthly earnings for a period varying with length of service. For 1 to 2 years of service, the benefit period is 6 months; for 2 to 3 years, 12 months; for 3 to 5 years, 18 months; for 5 to 10 years, 36 months; 10 to 15 years, 48 months; and for 15 or more years, 60 months. Workers with less than a year's service are to receive sixty days' pay in cash. Further, while they are

⁸ See, Little, E. H., *United States Rubber Company's Use of a Dismissal Wage*, American Management Association, Personnel Series, No. 6, 1930; *Dismissal Compensation*, Princeton, N. J., Industrial Relations Section, Princeton University, 1931; "A List of References on Dismissal Wage," *Monthly Labor Review*, February, 1932, Vol. 34, No. 2, pp. 478-493.

receiving such benefits, workers are entitled to all the usual benefits of regular employment, including free transportation, hospitalization, and others.

Workers may, if they wish, elect to receive lump sum separation allowances. If they do so, they sever all claims to the benefits usually accorded employees. Such allowances are also scaled according to the length of service, as follows:

<i>Service</i>	<i>Lump Sum Equivalent</i>
1-2 years	3 months
2-3 years	6 months
3-5 years	9 months
5 or more	1 year

Employees of less than one full year's service may receive five days' pay for each month worked. The agreement is to continue in effect for five years and affects only dismissals arising out of consolidations.⁹

Numerous other groups are now provided with dismissal compensation by similar collective agreements. In 1936, for instance, an agreement provided such benefits for 1200 ferryboat employees to be forced out of employment by completion of the San Francisco-Oakland and Golden Gate bridges.¹⁰

Unemployment insurance. Another possible method of stabilizing employment is the provision, on a broad scale, of unemployment reserve funds, popularly described as "unemployment insurance." These reserves are built up by contributions from employers and employed workers and distributed as unemployment compensation whenever eligible employees are out of work, thus sustaining consumers' demands in periods of slackening employment and prevent-

⁹See, "Dismissal Compensation for Railway Employees Displaced by Railroad Consolidations," *Monthly Labor Review*, June, 1936, Vol. 43, No. 6, pp. 1503-1507.

¹⁰"Dismissal Compensation for San Francisco Ferryman," *Monthly Labor Review*, October, 1936, Vol. 43, No. 4, pp. 867-869.

ing or reducing the usual spiral of increasing unemployment. In some cases, government contributions are added to those of employers and employees. Most plans for public unemployment insurance seek further to stabilize employment by offering special inducements or incentives to employers who maintain stable employment. This objective is sought, in public provisions in this country, by various arrangements that reduce the taxes levied against employers who succeed in effecting such stabilization.

Public unemployment insurance has been common on the continent since the years immediately preceding the World War. For several years before the war, a number of nations had experimented with various types of unemployment insurance. In some nations, notably Belgium and France, insurance was voluntary, and workers were permitted to participate or not, as they pleased. In others, notably England, Italy, and Germany, participation was compulsory for specified groups of workers. Various means of securing funds were utilized, and the amount of governmental subsidization differed from one nation to another. After the war, unemployment insurance became both more common and more uniform among European nations, although there remained the basic distinction between compulsory and voluntary plans. Recent figures indicate that foreign systems now provide coverage for some 40 million workers, as is indicated in Tables XVIII and XIX.

In this country, the first bill providing for public unemployment insurance was introduced in the legislature of Massachusetts in 1916, and the first state to enact a law on the subject was Wisconsin, which provided for a state system by act of the legislature in 1932. Benefit provisions of the act went into effect July 1, 1936. The federal congress has considered a series of bills, the first introduced in 1921, but no legislative action was taken until 1935, when the Social Security Act was passed. In the period immediately preceding state and federal legislation on the subject, unem-

ployment insurance was available to only a few employees in the United States, probably less than two hundred thousand, who participated in joint employer-union plans and in

TABLE XVIII
APPROXIMATE WORLD COVERAGE OF COMPULSORY UNEMPLOYMENT
INSURANCE, 1937

Country	Date of Original Act	Workers Covered (in thousands)
Australia (Queensland).....	1922	175
Austria.....	1920	1,012
Bulgaria.....	1925	280
Germany.....	1927	13,472
Great Britain and Northern Ireland.....	1911	14,003
Irish Free State.....	1920	380
Italy.....	1919	4,500
Poland.....	1924	957
Switzerland (13 cantons).....	1925	245
United States.....	1935*	21,000
Yugoslavia.....	1935	No data
Total.....		56,024

* Date of federal act. Benefits in most states begin 1938. Original Wisconsin act, 1932.

TABLE XIX
APPROXIMATE WORLD COVERAGE OF VOLUNTARY PUBLIC UNEMPLOYMENT
INSURANCE, 1937

Country	Date of Original Act	Workers Covered (in thousands)
Belgium.....	1920	899
Czechoslovakia.....	1921	1,407
Denmark.....	1907	375
Finland.....	1917	15
France.....	1905	192
Greece*		46
Netherlands.....	1916	564
Norway.....	1915	54
Spain.....	1931	62
Sweden.....	1934	240
Switzerland (12 cantons).....	1924*	307
Total.....		4,161

* No data available on date of original act.

* Date of national law. First cantonal act, 1925.

private plans provided by a few industrial concerns.¹¹

Although numerous bills were introduced in state legislatures for the purpose of providing public unemployment insurance in the years preceding the enactment of the federal Social Security Act, most state legislators apparently agreed that the necessary costs of such insurance would prove an unreasonable burden on employers who were forced to compete with those whose states had no such legislation. As has been noted, Wisconsin was alone in providing unemployment insurance by law before 1935. In spite of growing support for this type of legislation in the twenty-year period before that date, all other states had resisted efforts to provide it. The Social Security Act of 1935, however, effectively removed this most serious objection to state legislation. It prevented interstate competitive advantage by assessing a tax on employers alike throughout the states for the purpose of providing unemployment reserve funds.

More specifically, the unemployment insurance features of the Social Security Act may be described as follows: (1) The Act assesses a payroll tax on employers of eight or more employees throughout the nation, beginning in 1936. (2) Certain types of employees are exempt from the coverage of the Act and its taxing provisions, including agricultural labor, domestic servants, maritime labor, workers employed by their close relatives, employees in governmental services, and persons engaged in religious, charitable, and educational activities. (3) The tax rates are 1 per cent of payrolls in 1936, 2 per cent in 1937, and 3 per cent thereafter. (4) The federal government is provided with no means of distributing the funds thus collected in the form of unemployment benefits; the only way of providing such benefits is by means of state systems of unemployment insurance. (5) In those states providing a system of unemployment insurance financed by a payroll tax on employers and meeting

¹¹ See, *Social Security in America*, Chaps. I-III, Washington, Social Security Board, 1937; Yoder, Dale, *Labor Economics and Labor Problems*, Chap. VIII, New York, McGraw-Hill Book Company, Inc., 1933.

standards specified by the Act, employers may deduct payments into the state funds from the federal payroll tax in an amount not exceeding 90 per cent of the latter tax. In other words, the only way in which a state can secure the benefits to be derived from the funds collectible under the federal tax is by enactment of a state unemployment insurance system meeting the requirements established by the Social Security Act. When such provision is made, 90 per cent of the federal tax may be saved to the state directly, and, in addition, the federal government will provide funds for administration of the state unemployment compensation program.

The effectiveness of the Act in encouraging state unemployment insurance legislation may be gathered from the fact that by August, 1937, all the states, the District of Columbia, Puerto Rico, and Hawaii had enacted laws and secured approval of their programs from the Social Security Board. The coverage thus afforded extends to some twenty-one million employees. Question as to the constitutionality of the act was answered on May 24, 1937, when the United States Supreme Court upheld both the federal tax and a state tax for unemployment reserve funds.¹²

In most of the states, the new unemployment reserve provisions are to be administered by a division within the state labor department, although two states have placed administration in the hands of other departments, and several have made it quite independent of all older divisions. Advisory boards, representing employees, employers, and the public, are a common feature. Coverage of the laws varies

¹² The federal statute was upheld in *Steward Machine Co. v. Davis*, 57 Sup. Ct. 883, and the state statute in *Carmichael v. Southern Coal and Coke Co.* and *Carmichael v. Gulf States Paper Corporation*, 57 Sup. Ct., 868. Both were five to four decisions.

The court had previously allowed the decision of a New York court, holding the New York statute constitutional, to stand, its decision in that case being four to four. The case is *Chamberlain v. Andrews*, 49 October Term, 1936, November 23, 1936.

Meanwhile, the Dominion Supreme Court held the Canadian Employment and Social Insurance Act of 1935 unconstitutional on June 17, 1936, and this decision was supported by the Judicial Committee of the British Privy Council on January 28, 1937.

widely. The most common provision follows the federal act in including all employers of eight or more employees with the exception of those in excluded industries. Thirty laws follow this rule, while 11 provide coverage for employers of 1 or more, 2 apply to employers of 3 or more, 7 cover employers of 4 or more, and 1 applies to employers of 5 or more. In only 8 jurisdictions are employees taxed for this purpose, and only the District of Columbia provides for direct governmental contributions. The 8 laws providing for employee contributions limit them to 1 per cent, with 2 exceptions. In Louisiana, the maximum employee contribution is 0.5 per cent, while Rhode Island has a 1.5 per cent employee rate.

The most common provision as to benefits limits them to 50 per cent of wages, although several jurisdictions vary benefits according to the number of dependents. Maximum benefits are generally set at \$15 per week, while minimum benefits vary from \$5 to \$7.50. Twenty-five of the laws limit benefit periods to 16 weeks, and such limits range, in the various jurisdictions, from 12 to 20 weeks. The most common waiting period is two weeks.

There is considerable variety in the means provided by the various laws to encourage employers to stabilize employment. In general, laws seek to attain this objective by permitting reductions in rates of taxation in return for demonstrated stabilization. Four jurisdictions, for instance, would permit an employer to discontinue payments into reserve funds when the reserve credited to him reaches certain levels, but this practice represents the extreme. The more common provision may be illustrated by reference to the law of Minnesota, where the basic, long-time tax rate is 2.7 per cent. The state law provides, however, that after 1940, if an employer's reserve amounts to from 7.5 to 10 per cent, his tax rate shall be 1.8 per cent; if the reserve is 10 to 12.5 per cent, the rate is 1.3 per cent; if the reserve is more than 12.5 per cent, the rate is 0.9 per cent. Two states, Wisconsin and Nebraska, seek a similar objective by providing indi-

vidual employer reserve accounts, with no pooling of funds for benefit purposes. Contributions are credited directly to the employer's fund, and benefits are similarly charged against individual funds. Tax rates are reduced if these funds reach prescribed levels. Four other states have effected combinations of individual reserve accounts and pooled funds. Ten state laws make specific provision for further study of the possibilities of stabilization as a basis for subsequent legislation designed to perfect rating procedure and thus promote stabilization by employers.

It must be understood that reductions in state assessments granted employers in return for stabilization may be deducted from the federal tax as though they had been actually paid to the state. Section 902 of the federal act also allows states to reduce tax levies on employers who guarantee a specified minimum amount of employment each year. In order to qualify for this reduction, an employer must have provided the guaranteed minimum employment during the previous year, and he must have established a "guaranteed employment account" equal to 7.5 per cent of his total wages in that year. The minimum guarantee must provide at least 30 hours per week for 40 weeks, or one less hour per week for each additional week.

There are thus three ways in which states may permit a reduction in tax levies on an employer who effects prescribed stability in employment at the same time that the employer may have the reduction exempted from the federal payroll tax. Employers may secure such reductions, (1) by securing a high rating while contributing to a pooled fund; (2) by raising individual reserve accounts to specified levels; (3) by establishing an approved "guaranteed employment account."

Management is, of course, interested in every aspect of this program, but it can afford to give special attention to the rating provisions of present and future laws and to the rewards made available as described in immediately preceding paragraphs for employment stabilization. Many

alert managements may readily find in these provisions a source of distinct competitive advantage. It is to be expected that a large portion of the costs of unemployment insurance will, in the long run, be assessed against wages. This result appears to be quite inevitable, notwithstanding legislative provisions to the contrary. Those who are familiar with the marginal productivity analysis of wage determination will understand this tendency, for it appears rather unlikely that the provision of the unemployment insurance will result in any appreciable increase in the marginal productivity of workers. The net value of their services will, therefore, be somewhat reduced, and wages, over a period of time, are likely to be forced somewhat below the level they would otherwise attain. In other words, the system will enforce a sort of involuntary savings plan on employees. Employers who are successful in effecting stability in employment will then pay the going wage, which represents workers' productivity discounted for the cost of the insurance, and will at the same time achieve a reduction in their payroll taxes for stabilization, thus providing them with a distinct competitive advantage over those who have not achieved similar stability.¹⁸

The long-time effects of unemployment insurance legislation on stability of employment are by no means entirely clear. There are many who reason that, since the benefits thus provided tend to prevent the rapid spiral of unemployment, in which the destruction of purchasing power occasioned by idleness tends to enforce still greater unemployment, these benefits may also tend to prevent the flexibility in wages that appears essential if employment is to be maintained in periods of price recession. To the extent that this reasoning is correct, it is entirely possible that the provision of such reserves may tend to increase the perma-

¹⁸ Bauder, Russell, "The Probable Incidence of Social Security Taxes," *American Economic Review*, September, 1936, Vol. 26, No. 3, pp. 463-465; Yoder, Dale, "Some Economic Implications of Unemployment Insurance," *Quarterly Journal of Economics*, August, 1931, Vol. XLV, pp. 622-639.

ment level of unemployment and may act to postpone recovery from business recession.¹⁴

There is reasonable question, also, as to the probable effects of merit rating provisions in state unemployment insurance laws. If merit reductions allowed employers for stabilizing are counter-balanced by greater overdrafts on pooled funds from employers who do not succeed in effecting normal or ordinary stability, then funds will tend to be depleted over a period of time. Employers with stable employment will make decreasing contributions to funds, while those with unstable employment will occasion continued withdrawals in excess of their contributions. Meanwhile, of course, efforts to stabilize and thus to secure reductions in taxes may reasonably lead many employers to avoid temporary expansions in employment, thus effecting stabilization at a lower level of employment than would otherwise prevail.

Of course, many employers may prefer to disregard merit rating provisions almost entirely, on the theory that such ratings are largely matters of chance or luck, since ratings reflect, in part, the success of discharged employees in finding other jobs and thus avoiding compensation. In other words, the amounts charged against an employer's record as compensation represent, not a measure of the numbers of workers discharged, but rather the numbers that become eligible for benefits. Those who find other employment before becoming recipients of compensation do not stand against his record.

Finally, it may be noted in this connection that both England and Germany have experimented with various devices as a means of encouraging employment stabilization in connection with unemployment insurance, and both of these nations have discarded such practices.

¹⁴ See, Maurette, Fernand, "Is Unemployment Insurance a Cause of Permanent Unemployment," *International Labour Review*, December, 1931, Vol. 24, No. 6, pp. 663-684; Rorty, M. C., "Unemployment Insurance and Unemployment," *Journal of the American Statistical Association*, March, 1936, Vol. 31, No. 193, pp. 61-66.

Exercises and Problems

1. Prepare a brief of one of the articles mentioned in footnotes throughout the chapter.
2. Describe positions in which physically and mentally handicapped persons may be satisfactorily employed.
3. Prepare an outline of devices that may be used to control seasonal fluctuations in employment, indicating the major limitations of each.
4. Show that the problems of instability arising out of cultural and technological change are largely temporary.
5. What advantages have dismissal wages over unemployment insurance benefits?
6. Calculate dismissal wages for each of the following employees according to each of the plans mentioned in the chapter:

Worker	Age	Years of Service	Weekly Wage
A	20	5	\$25
B	30	10	40
C	60	10	40
D	60	30	50

Collateral Reading

- An Historical Basis for Unemployment Insurance.* Minneapolis: University of Minnesota Press, 1934.
- Beveridge, Sir William, *The Past and Present of Unemployment Insurance.* London and New York: Oxford University Press, 1930.
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- Douglas, Paul H., *Standards of Unemployment Insurance.* Chicago: University of Chicago Press, 1933.
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- Feldman, Herman, *Regularization of Employment.* New York: Harper & Brothers, 1925.
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- Smith, Edwin S., *Reducing Seasonal Unemployment.* New York: McGraw-Hill Book Company, Inc., 1931.
- Unemployment Benefit Plans in the United States and Unemployment Insurance in Foreign Countries.* Washington: Bureau of Labor Statistics, Bulletin No. 544, 1931.
- Unemployment Benefits and Insurance.* New York: National Industrial Conference Board, 1931.
- Unemployment Insurance and Prevention: A Select Critical Bibliography.* New York: American Association for Labor Legislation, 1931.
- Unions Provide Against Unemployment.* Washington: American Federation of Labor, 1929.

CHAPTER XX

Employee Representation

QUESTION may reasonably be raised as to the propriety of including a discussion of employee representation plans at the present time. It has been widely insisted that the National Labor Relations Act of 1935 has outlawed company unions, and it must be admitted that the interpretations of the present National Labor Relations Board lean heavily in that direction. Moreover, state labor relations acts of 1937, already in force in five states,¹ include similar provisions.

The legal interpretation of this and other similar proposed legislation is, in itself, a matter of moment in present day industrial relations, however, and it seems extremely unlikely that any sort of legislation will completely eliminate employee representation arrangements. Even though the number of employees involved in such plans may be greatly reduced as collective bargaining with outside, independent organizations becomes more general, there are phases of the representation plans that may be worthy of retention. There is, moreover, always the possibility that the forces of change may effect readjustments in which so-called company unions may cooperate with outside independent labor organization, as they have done and are doing in England and certain of the European nations. For these and other reasons, it may be worth while to give brief attention to the representation plan as a feature of industrial relations.

Terminology. At the outset, however, it may be well to evaluate some of the terminology used in describing these arrangements. They have sometimes been described as

¹ Pennsylvania, Massachusetts, Wisconsin, New York, Utah.

facilities providing for industrial democracy. Certainly, that is gross exaggeration. In certain forms, they might be regarded as highly limited democracies in which management carefully defines the limits of authority and rigidly maintains its own veto power over decisions. Only in those cases where industries have been organized as pure producers' coöperatives can such arrangements be described as actual or pure democracies, and even there a more accurate designation would mention their representative as well as their democratic features. In other words, the electorate of the so-called democracy is not ordinarily sovereign in the political sense.

Much more frequently, these associations have been described as "company unions," and there have been numerous objections to that terminology. Such objections have most frequently arisen out of the general impression that company unions are instituted, motivated, and sustained mainly by management's support, a condition that is denied, as far as their representation plans are concerned, by many managements. As a matter of fact, the term has much to recommend it, since it accurately describes the jurisdiction and major purpose of most such associations. At any rate, it has been acquiring increasing usage in this connection with the passing years.³

Purposes. Representation plans have generally been introduced by management, and the latter has had one or more specific purposes in mind. Perhaps the most frequent of such purposes has been the prevention of unions among employees, although several other objectives may have been as important. In many firms, plans have been instituted to provide a means by which managerial policies could be interpreted to employees and thus secure their coöperation. Again, the representation plan has sought to provide employees with a means of making their wants and opinions

³ See, Metcalf, Henry C., "Employee Representation," *Annals of the American Academy of Political and Social Science*, March, 1936, No. 184, pp. 184-191.

known to management, thus reducing employee grievances and preventing unrest.

Practically all plans have involved some formal means of bringing management and men together under friendly and favorable auspices to consider interests of mutual concern. They thus attempt to bridge the broad gap of the social distance that separates employing and managing groups from employees in modern, large-scale industry. At the same time, they encourage employees to discuss their common interests and to bargain collectively with respect to such interests.

Historic development. Employee representation plans have historic antecedents extending far into the past. It is said that they were suggested as early as 1849 in the Industrial Commission of the German Constitutional Assembly which was meeting in that year at Frankfort. In a sense, therefore, they are related to the rather general social revolutions of that period. Later, *works councils* were organized in mining and printing industries in England, and, in the period of the World War, they were extended into many additional industries. During the war, there was an extensive revolt among English workmen against the old-line trade union leadership, which was widely regarded as too conservative. Since the disaffection seriously interfered with established collective bargaining arrangements, it occasioned many strikes and much industrial unrest, conditions that were of particular concern at the time because of the wartime need for wholesale coöperation.

Accordingly, in 1916, the speaker of the House of Commons, Whitley, was appointed chairman of a committee established to effect a more satisfactory basis for coöperation between management and men. The committee, after an extensive investigation of existing conditions, brought in a report in 1917 which included, among others, the following recommendations: (1) a national Joint Industrial Council consisting of representatives of management and men should be formed for each major industry; (2) similarly constituted

district industrial councils should be formed; and (3) this type of organization should be carried down to individual shops, in which joint works committees should be provided. An immediate campaign to effect such arrangements was undertaken, and, by 1921, the recommendations had resulted in the formation of shop committees in some 80 industries and involving some four million employees. The committees thus established were widely referred to as Whitley councils. They have since declined in number and importance, featuring some 73 industries in 1922, 43 in 1925, and 42 in December, 1930. A more recent study³ indicates that some 94 industrial councils have been established, of which thirty have ceased to function. Those that are operating have written constitutions and committees made up of equal numbers of representatives for workers and employers, and they engage in such continuing activities as the collection of statistics concerning the industries they represent, in addition to the settlement of controversies and grievances. The most frequently encountered source of disaffection and controversy appears to be wages.⁴

The war speeded adoption of representation plans in the United States also, although there had been a growing interest in such arrangements for several years prior to the war. As early as 1886, according to Watkins, the possible values of such arrangements were discussed publicly, and the Filene Coöperative Association, instituted in 1898, had many of the features of a representation plan, although its early purposes were primarily concerned with insurance for its members. In 1903, the Nernst Lamp Company started its employee representation plan, and, in 1904, the plan of the American Rolling Mill Company, similar in nature, was instituted. Then, in 1907, the plan of the Nelson Valve Company was put into effect, and in 1911, that of Hart Schaffner

³ Cf. Seymour, J. B., *The Whitley Councils Scheme*, London, P. S. King, 1932; *Committee Movement In Industry*, London, Institute of Industrial Welfare Workers, 1928.

⁴ See, also, Spates, T. G., "Industrial Relations in the Zeiss Works," *International Labour Review*, August, 1930, Vol. 22, No. 2, pp. 177-198.

and Marx was instituted, as was that of the Philadelphia Rapid Transit Company following a serious strike in 1910. In 1913, the Leitch plan was initiated in the plant of the Packard Piano Company at Fort Wayne, Indiana, that of the White Motor Company began in 1914, and the Rockefellers set up a system of employee representation in the Colorado Fuel and Iron Company in 1916.

To some extent, wartime experience in this country parallels that of Great Britain. While there was no general revolt against trade-union leadership, there was widespread expression of the need for closer coöperation between management and employees in the national emergency, and there was serious industrial unrest arising primarily from the failure of wage increases to keep pace with rapidly rising living costs. Numerous official commissions and boards, including the Shipbuilding Labor Adjustment Board of the Emergency Fleet Corporation, the President's Mediation Commission, the United States Fuel Administration, the National War Labor Board, and the United States Railroad Administration, urged that employers establish representation plans with which to reduce friction, adjust complaints, and improve coöperation. Numerous plans were undertaken, as is shown by the fact that a study of existing arrangements in 1935 disclosed that approximately 15 per cent of them were of wartime origin, while only 1.8 per cent of the existing plans antedated the war.

A study of plans in operation in 1935⁵ indicated that 16 per cent of existing plans were formed in the years from 1920 to 1932, while 63.5 per cent of them were instituted in the period since that time and prior to April, 1935. The period immediately following the war saw many plans initiated in efforts to prevent unionization of employees by outside, independent labor organizations. In 1920, the membership of independent unions reached the highest level in the history of the nation to that time, and many employers felt

⁵ Senturia, J. J., "Types of Employer-Employee Dealing," *Monthly Labor Review*, December, 1935, Vol. 41, No. 6, pp. 1441-1465.

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that steps must be taken to curb the advance of these organizations. Accordingly, whereas 145 concerns reported having such plans in 1919, 385 plans were reported in 1922, 421 in 1924, and 432 in 1926.⁶ The number was slightly reduced to 399 in 1928, and it was further restricted to 313 in 1932. The numbers of workers involved in these associations varied in somewhat similar proportions, as shown in Table XX.

TABLE XX
GROWTH OF EMPLOYEE REPRESENTATION

	1919	1922	1924	1926	1928	1932
Individual firms.	145	385	421	432	399	313
Workers involved	403,765	690,000	1,240,704	1,369,078	1,547,766	1,263,194
Works councils..	196	725	814	913	869	767
New plans.....	....	317	173	59	14	7
Discontinued						
plans.....	....	77	137	48	41	86
Increase in firms.	....	-240	-36	11	-33	-79

Source: National Industrial Conference Board, *Reports*.

In 1933, when the Democratic Roosevelt administration took over the government, it promised a "new deal," and an important part of the readjustment was designed to increase the power and influence of organized labor. The business of the nation was at such a low ebb, and public tension was so great, that few employers made any serious protest, and plans for a comprehensive reorganization of the control of industry met with little public opposition. On June 16, 1933, the President approved the National Industrial Recovery Act, which included as its section 7a the declaration that,

Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers, or their agents, in the designation of such representatives or in self-organization, or in other

⁶ See, *Collective Bargaining Through Employee Representation, 1933; Individual and Collective Bargaining under the N.I.R.A., 1933, and Individual and Collective Bargaining in May, 1934, 1934*, New York, National Industrial Conference Board.

concerted activities for the purpose of collective bargaining or other material aid and protection.

No employee, and no one seeking employment, shall be required as a condition of employment to join any "company union" or to refrain from joining, organizing, or assisting a labor organization of his own choosing.

The Act was widely described as having made collective bargaining compulsory, and union organizational activity was naturally stimulated. Many managements, faced with the necessity of bargaining collectively by the requirements of the Act and the industrial codes promulgated in accordance with its provisions, sought to evade the necessity of bargaining with independent labor unions by establishing their own representation plans. As a result, the numbers and coverage of these plans increased rapidly. In April, 1935, an inquiry addressed to 43,000 firms (22.1 per cent of all those in the industries covered) by the Bureau of Labor Statistics, and to which 14,725 firms replied, discovered that 593 or 4 per cent of all had company unions. Of the 1,935,556 employees of these firms, 385,954 or 20 per cent were members of such organizations. A nation-wide survey by the Commonwealth Fund in March, 1935 estimated that there were some 2½ million members in such unions. The plans were particularly extensive on the railroads and in other public utilities, although they were frequently found in all industrial classifications.⁷

In many respects, this development of representation plans under the National Recovery Administration parallels similar developments in several European nations. In Germany, Austria, Czechoslovakia, and Norway, for instance, somewhat similar works councils were made obligatory upon industry by statute. Meanwhile, as has been indicated, voluntary provisions have featured industrial evolution in the postwar period in England. In all such developments, there is discernible a distinct tendency to restrict the for-

⁷ *New York Times*, May 5, 1935; Muste, A. J., "The Story of Company Unionism: What is a Company Union?" *Railway Clerk*, July, 1928, Vol. 37, No. 7, pp. 320-321.

merly arbitrary power of employers and to recognize something in the nature of a social interest in the preservation of a balance of power between management and men.

Types of representation plans. Existing representation facilities may be classified according to a number of fairly distinctive criteria. One such basis is the nature of their relationship to independent labor unions. In England and in several European nations, these organizations are often affiliated directly with outside unions. In the United States, no such relationship exists, and, on the contrary, there is a strong feeling on the part of independent organizations that company unions are competitors of independent unions and should be opposed and attacked as a natural enemy. To some extent, this feeling has been tempered in the minds of many union leaders by the belief that representation plans generally encourage employees to see the advantages of collective bargaining, so that they are the more ready to join independent unions.

Representation plans may also be classified as statutory or voluntary. Statutory or compulsory plans are typical of a number of industries in Germany, Italy, Czechoslovakia, and other European nations, being required by law. Voluntary systems are undertaken by employers or employees or both without compulsion.⁹

So far as the composition of their membership is concerned, representation plans exhibit two distinct types. In one, the most common in the United States, only employees are regarded as actual members, and this type of organization is typified by the general company union. In the other, illustrated by many shop or works councils, representatives of employees and of management cooperate in joint committees. The latter type has been most favored in several European countries.

Representation plans might be classified also according to their territorial coverage, although most of those in the Unit-

⁹ See Guillebaud, C. W., "Industrial Relations Councils," *Encyclopedia of the Social Sciences*, 1935 edition, Vol. VII, pp. 717-722.

ed States are local in scope. In older nations, there are national industrial councils, district industrial councils, local industrial councils, and individual shop committees, as has been suggested in the mention of Whitley councils.

Three major divisions appear when representation plans are classified according to structure. One of them depends almost entirely, as far as action is concerned, upon representative committees. Individual employees are members of the association, but all actions are taken by representative committees selected by workers. Sometimes, these committees are *joint*, in that representatives of management are also members of them. In other cases, only employee representatives are members. In 1926, when new associations were appearing rapidly, approximately 90 per cent of all plans in the United States were of this type, and, in 1933, more than half of the plans investigated by the National Industrial Conference Board at that time were of the committee type.⁹

A variation of this committee system is the governmental type or *federal* system, typified by the Leitch plan, developed at the Packard Piano Company. In this plan, employees elected representatives to a congress, while management formed the executive branch of government. Suggestions for changes desired by employees were debated in house and senate, whose actions were then referred to the executive cabinet for approval. The plan is often described as providing employees with the same governmental authority as is vested in citizens of a republic, particularly the United States. There is, however, one obvious and highly significant difference—in the American political system, vetoes may be overruled by the representatives of the electorate. This type of plan has become less popular in recent years.

Representation plans have, in the immediate past, tended toward all-inclusive organizations that may or may not be featured by permanent committees and that are generally described as company unions. Proposals for definitive ac-

⁹ *Monthly Labor Review*, February, 1934, Vol. 33, No. 2, p. 311.

tion on the part of the group are generally submitted to the membership as a whole. Special committees may be appointed or elected for specific purposes. Collective bargaining with management is the major but not the only purpose of the associations. This type of arrangement was formerly regarded as suitable for only the smaller industrial units, but its effectiveness in large organizations has lately been clearly demonstrated. It represents a third type of plan.

In recent arrangements, membership is, of course, voluntary rather than compulsory, as was frequently the case in the years prior to the enactment of the National Labor Relations Act. Plans now generally stress the inclusion of such provisions as usually characterize a trade agreement between an employer and a union, including stipulations as to wages, hours, seniority, layoff and discharge, and related working conditions. A special provision for arbitration of grievances is common. Numerous associations of this type have emerged since the National Labor Relations Board and various state labor boards have ruled that older, dependent organizations were not eligible to become approved bargaining agencies.¹⁰

Industrial distribution. Until the advent of the National Industrial Recovery Act, employee representation plans appeared to be increasing in the larger plants and decreasing in the smaller units. Thereafter, until the enactment of the Labor Relations Act of 1935, they increased in number in all sizes of units.

In the war and postwar period, metal plants were most numerous among the firms that had representation plans. Later, in the immediate predepression years, after the railway shopmen's strike and the crushing defeat administered to the union in that field, railroads became the most important sponsors of such plans. After 1933, these arrangements

¹⁰Saposs, David J., "Organizational and Procedural Changes in Employee Representation Plans," *Journal of Political Economy*, December, 1936, Vol. 44, No. 6, pp. 803-811.

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were much more widely distributed. In the survey made by the Bureau of Labor Statistics in 1935, they were found in

TABLE XXI

INDUSTRIAL DISTRIBUTION OF REPRESENTATION PLANS, 1935

Source: *Monthly Labor Review*, December, 1935, p. 1448.

Industry Group	% of Establishments Dealing			
	Individually	With Some or All Workers through Trade Union	Through Company Union	Through Company Union and Trade Union
All industries covered.....	76.5	19.5	3.4	0.6
All manufacturing industries.....	73.8	21.0	4.5	.7
Durable goods.....	81.0	12.4	5.8	.8
Iron and steel.....	77.1	13.1	8.6	1.2
Machinery.....	83.8	9.1	6.4	.7
Transportation equipment.....	76.8	10.3	11.3	1.6
Nonferrous metals.....	86.1	9.1	4.3	.5
Lumber and allied products.....	86.1	10.4	3.3	.2
Stone, clay, and glass products.....	66.9	28.3	3.7	1.1
Nondurable goods.....	68.2	27.7	3.4	.7
Textiles*	63.3	33.3	2.8	.6
Fabrics (except hats)	79.9	16.0	3.4	.7
Wearing apparel (except millinery).....	42.5	55.0	2.0	.5
Leather.....	63.0	29.3	7.7	...
Food.....	76.1	21.8	1.4	.7
Cigars.....	64.6	35.4	...	...
Paper and printing.....	59.3	37.4	3.2	.1
Chemicals.....	84.8	4.0	9.3	1.9
Rubber products (except boots and shoes).....	72.9	11.4	10.0	5.7
Miscellaneous nondurable goods.....	50.0	50.0	...	...
Miscellaneous manufactures.....	65.9	17.6	11.8	4.7
Services.....	88.8	10.6	.5	.1
Public utilities.....	64.6	25.3	7.0	3.1
Mining.....	46.6	52.2	1.0	.2
Retail trade ^b	93.0	5.4	.7	.9
Wholesale trade ^c	95.9	3.7	.4	...

* Including miscellaneous textile products.

^b Covers only retail grocery, meat, and produce stores, the general merchandise group, and the women's ready-to-wear stores.^c Covers only automotive, chemicals and drugs, dry goods and apparel, electrical equipment, farm products, farm supplies, and food products.

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manufacturing, retailing, public utilities, mining, and many lesser industrial divisions, and leading industries, as far as dependence on this type of relationship is concerned, were transportation equipment, rubber products, and chemicals. In telephone, telegraph, and railroads, 24.1 per cent of all workers were so represented. The distribution of those plans is shown in detail in Table XXI.

Distinctive differences featured plants of varying size. Individual bargaining was most prominent in smaller establishments, while employee representation plans became more

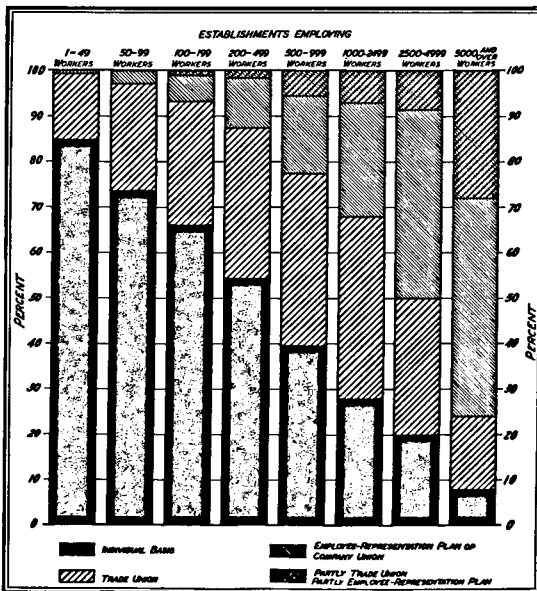


Fig. 34.—Methods of Dealing with Employees in Plants of Different Sizes, 1935. (Source: Bureau of Labor Statistics.)

important with increases in the size of plants. These characteristics are graphically shown in Figure 34.

General features. A number of features are so common to employee representation plans that they may reasonably be described as typical. Among them are definite eligibility requirements for membership, usually stated in terms of months or years of service; specifications as to the numbers of representatives for workers or both workers and management, where the latter is included in joint committees; provisions for arbitrating disagreements, including stipulations as to the use of outside arbitors or representatives (a frequent source of objections from management); attempts at clear-cut definitions of the fields of authority reserved for the association and for management; and arrangements to provide for the financial support of the association. The last mentioned provisions generally describe some sort of dues, ordinarily at a rate considerably lower than the usual dues of independent labor organizations. Frequently, in the past, management has taken care of all expenses of the association, paying the secretary's salary, providing necessary stationery and other equipment, and otherwise assisting the association. The costs of such assistance were charged to personnel administration, or to education, or to service activities in behalf of employees.

Under provisions of the present National Labor Relations Act, such subsidization is almost certainly an "unfair labor practice" as defined by that federal statute, and support has, for this reason, been withdrawn in many cases.

A recent study by the Bureau of Labor Statistics¹¹ revealed interesting limitations upon the characteristic features of representation plans. In order to compare representation plans with independent unions, it sought to discover how many of the former had five major features, including: compulsory dues; regular meetings; written agreements with management; relationships and contacts with

¹¹ *Monthly Labor Review*, October, 1935, Vol. 41, No. 4, p. 865ff.

outside, independent labor organizations or other company unions; and the right to demand arbitration on demands refused by management. The study assumed that unless company unions had such features, they could not really function as effective collective bargaining agencies. It found that less than 1.2 per cent of all workers belonged to representation plans providing these features.

Many of the plans have provided an excellent outlet for workers' desires for self-expression, leadership, and recognition. They have numerous offices and committees, which provide means of gratifying employee yearnings for power and prestige. Also, organizations have frequently provided recreational facilities, including clubhouses, athletic fields and halls, and other similar equipment.

Employee attitudes toward representation. The attitudes toward representation systems expressed by employees of the concerns in which these systems operate vary widely, as might be expected. The arrangements have their opponents and their proponents. Many employees can see little or no reason for them. Still others insist that their only useful service is to management, mainly in their prevention or retardation of union membership. A few, members of independent unions, regard company unions as rather effective training schools for union members, insisting that once employees have tasted collective bargaining in the more limited form available through the representation plan, they will demand the more extensive privileges afforded by membership in independent unions.

It is generally agreed by those who have had trade union experience that representation plans do not ordinarily provide what is generally described as true collective bargaining. In support of that position, it is argued that such bargaining, to be effective, must result in collective agreements between employees and management, and that it must allow workers to be represented by outside bargainers, not employees whose future may be subject to control by management. Employees, it is felt, cannot be effective bargainers because

they are dependent for employment upon the management with which they are dealing and because they have neither the experience nor the sources of information available to specialized bargaining agents who travel from one locality to another, specializing in the formulation of collective agreements. Since few representation plans provide for the services of outside representatives, their opponents insist that they cannot provide true collective bargaining.

On the other hand, many employees regard these associations as better adapted to the needs of workers than are existing independent unions, and it appears reasonable that the success of many representation plans is directly attributable to certain fairly obvious deficiencies in independent unionism. The representation plan is, in many cases, better adapted to employees' needs in its coverage, since it offers membership to a group having a large range of common interests. By including all employees of one plant or concern, and no more, it has an appropriate size and coverage that independent organization frequently does not provide. Again, most independent unions, until recently, have been of the craft type, so that workers within the plant were not all included in any one union but were divided among several such organizations. Moreover, they were thus associated, in many cases, with other unionists whose interests were not particularly similar to theirs, as when workers in radio factories joined the electrical workers union, or machinists in an automobile plant affiliated with the international machinists union.

Many workers have expressed preference for the company union because of objection to racketeering in independent organizations. At the same time, they have appreciated the lower rates of dues required by representation plans. In many cases, representation plans are preferred because they involve no such limitations on membership as do some independent unions. Ordinarily, all races, nationalities, and both sexes are admitted on a basis of equality. Moreover, there are only nominal initiation fees, which are contrasted

by many employees with the high fees often enforced by independent unions.¹²

On the whole, however, it must be said that most workers have taken neither a positive nor a negative position with respect to these associations. Rather, they have tolerated them and utilized them whenever they appeared useful. A few workers have reacted strongly for or against them. To some, they have proved a much desired opportunity for leadership and opposition. To others, they have represented the most effective barrier to independent unionism. To most workers, however, they have been something management advanced and fostered and in which workers had only a casual interest. Generally speaking, managements have secured from the plans about what they put into them, not what workers have contributed. Few employees have been interested in sharing management's problems, in spite of all the description of such worker interest. Rather, they have asked for security, higher wages, and improved working conditions; and, to the extent that representation plans could aid in securing these tangible advantages, they have utilized the plans.

TABLE XXII
RESULTS OF NATIONAL LABOR RELATIONS BOARD ELECTIONS, 1934-1935¹³

Organization	Votes Cast	
	Number	Per Cent of Total
Trade Union	26,478	58.5
Company union	15,060	33.2
Other	3,749	8.3
All	45,287	100.0

* For the most part, votes for individuals without affiliation.

¹² Leiserson, Wm., "Company Unions," *Encyclopedia of the Social Sciences*, 1935 edition, Vol. IV: pp. 123-126; Renold, C. G., "Trade Unions or Company Unions," *Survey Graphic*, September, 1935, Vol. 24, pp. 432-433; Stuart, C. J., "Ten Years with a Work Council," *Factory Management and Maintenance*, February, 1934, Vol. 92, No. 2, pp. 53-56.

¹³ Wheeler, George S., "Employee Elections Conducted by the National Labor Relations Board, up to June 16, 1935," *Monthly Labor Review*, October, 1935, Vol. 41, No. 4, p. 956.

Since the beginning of the recovery program in 1933, however, there has been a notable tendency on the part of workers to prefer that outside unions bargain for them. This development is clearly shown in the results of elections held by the National Labor Relations Board in the period from July 10, 1934 to June 16, 1935. These results are summarized in Table XXII.

Legal status of representation plans. The legal status of representation plans is not entirely clear. As has been indicated in preceding pages, the National Industrial Recovery Act of 1933 was widely believed to have made collective bargaining compulsory for all industries involved in interstate commerce, but it was thought that bargaining with a company union or representation plan (as long as the latter avoided obvious employer domination) met the requirements of the Act. Its section 7a was directly responsible for the striking growth of representation plans in 1933 and 1934.

A similar provision incorporated as section 7 of the National Labor Relations Act, has more recently been interpreted, along with the remainder of that Act, as greatly restricting if not entirely prohibiting these company-wide, bargaining associations. The new law, in its definition of "unfair labor practices," includes as unfair the domination of any labor organization and any action on the part of an employer to interfere with or prevent unionization of his employees. The National Labor Relations Board, which is charged by the act with the enforcement of its provisions, has interpreted the section which describes it as unfair for any employer "to dominate or interfere with the formation or administration of any labor organization or contribute financial or other support to it" to mean, in its words, that "formation and administration of labor organizations are the employees' and not the employer's concern."¹⁴

State labor relations laws have followed the same general direction in defining required collective bargaining pro-

¹⁴ First Annual Report, National Labor Relations Board, p. 94.

cedure. The Wisconsin act, for instance, expressly prohibits the designation of company unions as bargaining representatives, and it proceeds to define company unions as follows:

The term "company union" means any committee, employee representation plan or association of employees which exists for the purpose, in whole or in part, of dealing with employers concerning grievances or terms and conditions of employment, which the employer has initiated or created or whose initiation or creation he has suggested, participated in or in the formulation of whose governing rules or policies or the conducting of whose management, operations or elections the employer participates in or supervises or which the employer maintains, finances, controls, dominates, or assists in maintaining or financing, whether by compensating anyone for services performed in its behalf or by donating free services, equipment, materials, office or meeting space or anything else of value, or by any other means.

The New York act follows that of Wisconsin in excluding all such associations as bargaining agencies. The Wisconsin act attains this objective by refusing to include company unions on the roster of accepted bargaining representatives. In Massachusetts and Pennsylvania, the labor boards have not, as yet, interpreted provisions with respect to company unions, but a similar ruling is entirely possible.

The constitutionality of this type of regulation remains a matter of conjecture, although the Supreme Court decisions on the National Labor Relations Act indicate that such legislation may go far without meeting constitutional limitations. Hence, if state labor boards follow the course of the National Labor Relations Board, it may be almost impossible to secure approval of any independent, company-wide union as a bargaining agent. In the Inland Steel Company hearings before the Board's examiner in the late summer of 1937, it was apparent that agents of the Board could scarcely conceive of any sort of company union that is without managerial domination.

Assuming that all this legislation is held to be constitutional, although that assumption appears scarcely justified so far as some of the most drastic provisions are concerned,

it may be concluded that representation plans, in the future, may be greatly restricted in function and in value to both employees and management. Where such plans take the form of completely independent unions, receiving absolutely nothing in the way of encouragement or support from management, they may be permitted to act as bargaining agents for their members. In other instances, where they cannot qualify as bargaining agencies, they may serve, as they have in the past, as means of familiarizing employees with managerial policies, and as facilities for direct intercourse between employer and employee. There is probably ample justification for such associations in many concerns even though collective bargaining is precluded.

Conclusion. Generally, management can expect the representation plan to function successfully only if it gives considerable attention to its operation. It is perfectly true that the most successful plans have had extensive managerial attention, coöperation, and outright support. At the same time, it is equally important that a sufficiently large sphere of authority be left to members of the association so that they are entirely justified in participation. In other words, the plan must be largely for the worker, or he cannot be expected to give it his support. Certainly, employees should be encouraged to develop the program along lines of interest to themselves as well as to management, and they should be allowed complete freedom as to membership in it.

A representation plan may be expected to secure employee support only if it offers genuine advantages not to be secured in any other manner. It must be a bona fide employee association, not dominated by a few stool pigeons planted in it by the management. It is entirely reasonable to allow the association, if it is fairly representative of employees, representation on the board of directors, so that workers' interests may be presented to that body. More than a dozen firms have arranged such representation. Plans must provide for frequent meetings if interest is to be maintained, and

programs designed to provide education and discussion on common problems help to sustain employee support and participation.¹⁵

Exercises and Problems

1. Draw up plans for an employee representation plan, defining membership requirements, dues, functions, regulations, and all other initial requirements.
2. Prepare a letter to new employees describing your plan and explaining why it is to be preferred to each of the other major types of such plans.
3. Measure the significance of relationships between membership in the representation plan and promotions, education, ratings, and wages, as shown by the following tabulations. Are any of these relationships significant?

Promotions and Membership

Promotions	Representation Plan	
	Members	Non-Members
Promoted	492	157
Not Promoted	608	473

Ratings and Membership

Ratings	Representation Plan	
	Members	Non-Members
Excellent	201	94
Good	407	180
Fair	409	340
Poor	183	28

Wages and Membership

Weekly Wages (m of class)	Representation Plans	
	Members	Non-Members
20	70	40
25	272	160
30	485	275
35	215	121
40	58	34

Collateral Reading

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Cowdrick, Edward S., *Handbook of Business Administration*, Chap.

¹⁵ Aresty, Julian J., and Miller, Gordon S., "The Technique of Arousing and Maintaining the Interest of Foremen and Workers in Plans of Employee Representation," *Personnel*, February, 1930, Vol. 6, No. 4, pp. 115-132; "Some Essentials of a Sound Employee Representation Plan," Princeton, N. J., Industrial Relations Section, Princeton University, 1932.

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CHAPTER XXI

Collective Bargaining

INCREASING power and prestige accorded organized labor since the inception of the Roosevelt administration in 1933 have been featured by a militant campaign to extend collective bargaining in American industry. Many employers who long insisted that they would not deal with unions, or that they certainly would not allow bargaining representatives from outside the ranks of their employees to represent their workers, have found it necessary, in recent years, to effect a complete change in that position. Both federal and state legislation have tended to force such a change, and the courts have given their approval to such legislation. When, therefore, on April 12, 1937, the United States Supreme Court sustained the National Labor Relations Act in each of five cases,¹ employers were left with little justification for prolonging their acceptance of the changing order, and the number of workers who are employed under collective agreements has increased rapidly.

Collective bargaining, in most cases, exhibits distinctive characteristics that differentiate it clearly from the majority of employee representation arrangements referred to in the preceding chapter. In representation plans, workers' associations include only the employees of a single firm, and the unit of organization is most commonly the individual plant. Employees are generally represented, in whatever bargaining takes place, by men selected from their own ranks.

¹ *Washington, Virginia, and Maryland Coach Company v. National Labor Relations Board*; *Associated Press v. National Labor Relations Board*; *National Labor Relations Board v. Jones and Laughlin Steel Corporation*; *National Labor Relations Board v. Freuhauf Trailer Co.*; *National Labor Relations Board v. Friedman-Harry Marks Clothing Co., Inc.*

Moreover, as has been indicated, employers have frequently taken the initiative in starting and fostering the representation plans, so that they are, for the most part, primarily managerial devices rather than spontaneous employees' associations. Furthermore, some of them provide for joint representation of management and men on the committees they establish.

Important characteristics of independent unions are likely to be distinctly different. Membership is not ordinarily confined to the employees of a single firm or plant but includes workers in similar trades or industries and in other localities. The local unit with which an employer deals is part of a wider, more inclusive national organization, and it may be federated with other nationals in other crafts or industries. Bargaining representatives are likely to be brought in from outside, and they represent specialists in bargaining, rather than lay workers from the production line. No managerial sponsorship is permitted, and representatives of management are ineligible for membership in the independent union.

Legal status of unions. As has been suggested, the recent growth of collective bargaining is closely related to a comprehensive change in the legal status of labor unions in this country. Collective bargaining has long been legal in the United States, and unions have not been forbidden by law, but employers had ample legal support for their refusal to participate in collective bargaining if they wished to avoid it. Further, they had the right, repeatedly upheld by the courts, to select non-union employees and to discharge unionists if they so desired. Anti-union employers generally secured this result by providing and requiring applicants for employment to sign what were known as "iron-clad" or "yellow-dog" contracts, in which the applicant agreed not to be or become a member of any independent labor union so long as he remained in the employ of the firm with which he contracted.

There were numerous efforts to outlaw these contracts,

and legislation to that end was passed by both federal and state governments. In each case, however, the United States Supreme Court held the legislation unconstitutional, regarding it as a violation of the fifth or fourteenth amendments.² When this avenue of approach appeared definitely closed, several states sought to effect the same result by declaring such contracts contrary to public policy, so that an employer who uses them comes into court with unclean hands. Legislation of this type is now in effect in seventeen states.

The value of such legislation is now reduced, however, for the right of an employer to discriminate against union workers has been generally eliminated by federal and state legislation since 1933. The National Industrial Recovery Act of 1933 included a clause requiring that all codes formulated under provisions of the act should contain specific provisions guaranteeing the right of employees to organize and to bargain collectively. Later, after that act had been held unconstitutional in the *Schechter* case (1935), a similar provision was incorporated in the National Labor Relations Act, which further declares that any action by an employer designed to interfere with collective bargaining represents an unfair labor practice, prohibited by the Act. State labor board acts in several states have extended the same doctrine to intrastate industries.

The present legal status of organization may, perhaps, best be illustrated by the words used by the Supreme Court in upholding the constitutionality of the National Labor Relations Act. With respect to the right of workers to organize and to bargain collectively, the court said:

That is a fundamental right. Employees have as clear a right to organize and select their representatives for lawful purposes as the respondent has to organize its business and select its own officers and

² See, Sublette, Myrick H., "The Legalization of Labor Combinations," *American Federationist*, November, 1935, Vol. 42, No. 11, p. 1201ff.; Yellen, Samuel, *American Labor Struggles*, New York, Harcourt, Brace & Company, Inc., 1936; Yoder, Dale, *Labor Economics and Labor Problems*, Chap. XVII, New York, McGraw-Hill Book Company, Inc., 1933.

agents. Discrimination and coercion to prevent the free exercise of the right of employees to self organization and representation is a proper subject for condemnation by competent legislative authority. Long ago we stated the reason for labor organizations. We said that they were organized out of the necessities of the situation; that a single employee was helpless in dealing with an employer; that he was dependent ordinarily on his daily wage for the maintenance of himself and family; that if the employer refused to pay him the wages that he thought fair, he was nevertheless unable to leave the employ and resist arbitrary and unfair treatment; that a union was essential to give laborers opportunity to deal on an equality with their employer.

The quotation is from the decision in the case involving the Jones and Laughlin Steel Corporation.

While the National Industrial Recovery Act was in force, the collective bargaining provisions incorporated in its section 7a were enforced first by a temporary and unofficial seven-member board (hastily formed by the President on August 5, 1933, to reduce growing industrial strife) and by special labor boards in several industries. Some boards were created by the industrial codes (as was true in bituminous coal, petroleum, and daily newspapers) and some of them were established by executive order of the President (as were those, for instance, in automobiles, steel, and textiles).⁹ Later, this work was carried on by the National Labor Relations Board, authorized as an emergency body by joint resolution of Congress in 1934 and formed on July 9 of that year. The board established seventeen regional

⁹Labor boards provided at this time included: Automobile Board, National Bituminous Coal Labor Board, National Longshoremen's Board, National Steel Labor Relations Board, Newspaper Industrial Board, Petroleum Labor Policy Board, Industrial Relations Committee for the Shipbuilding and Shiprepairing Industry, Textile Labor Relations Board, Electrotyping and Stereotyping Industry Code Labor Board, Industrial Relations Committee for the Lithographing Printing Industry, Photo-Engraving Industry Labor Board, Printing Ink Manufacturing Industrial Labor Board, Coat and Suit Industrial Relations Board, Commercial Relief Printing (Zone 16) Labor Complaints Board, Joint Industrial Relations Board for the Textile Print Roller Engraving Industry, Infants and Children's Wear Industry National Labor Complaints Committee, Labor Complaints Committee in the Motion Picture Industry, Dress Code Authority Industrial Adjustment Agency, Cotton Garment Code Authority Labor Complaint Committee, Men's Neckwear Industry Labor Complaints Committee, Cigar Manufacturing Labor Complaint Board, Men's Clothing Code Authority.

boards to assist it. When the act was held unconstitutional, this board ceased functioning, but its work was taken up a few months later by the National Labor Relations Board provided by the National Labor Relations Act, approved July 5, 1935.

National Labor Relations Act. The present act clarifies somewhat the government's position with respect to collective bargaining, for it gives the new Board a status similar to that of the Federal Trade Commission. The Board, composed of three non-partisan members appointed by the President with the approval of the Senate, is authorized to prevent certain designated "unfair labor practices," which are regarded as improper interference on the part of employers in the process of collective bargaining. The act restates section 7a of the National Industrial Recovery Act, authorizes the Board to conduct elections and to designate the proper bargaining representatives in specific situations, and instructs it to prevent the unfair labor practices, which include (1) interference with self-organization, (2) domination of an employee organization, (3) discrimination against employees for union membership, (4) discrimination against employees for complaint to the Board, and (5) refusal on the part of an employer to bargain collectively.

In attempting to perform these functions, the Board has developed a formalized procedure. When workers, either as individuals or representatives of a union, file a complaint with a regional office, the local representatives of the Board undertake a preliminary investigation. Effort is made to settle the matter by conciliation, and an election supervised by the Board frequently removes the basis of dispute. If no such settlement is effected, and if the local representatives feel that the Board has jurisdiction and that further investigation is warranted, recommendation is made to the National Labor Relations Board that a formal complaint be issued. Hearings are then held before an examiner appointed by the Board. Usual rules of evidence do not prevail, and an informal procedure is enforced. Facts brought out in the

hearing are carefully recorded and transmitted to the Board, along with the examiner's recommendation as to appropriate action. The Board, after an examination of this report, makes public its findings of fact and its orders to the employer, if it holds such orders to be appropriate. Frequently, these orders require reinstatement of former employees and payment of back wages. If an employer fails to comply with these orders, the Board is authorized by the act to petition a federal Circuit Court of Appeals (or, if all such courts are in vacation, a district court) for a court order requiring compliance. Since the circuit courts are distinctly appellate bodies, they do not have facilities for securing additional evidence, so that the findings of fact by the Board are particularly important, and that importance is increased by the provision of the law that, "the findings of the board as to the facts, if supported by evidence, shall be conclusive." This procedure, it will be observed, places great responsibility upon the Board's examiners, and it is to be hoped that they will develop and maintain an appropriate level of judicial impartiality. In the Jones and Laughlin Steel Company Case, the Supreme Court held that this procedure violated no constitutional guarantees.

State labor board acts. The provisions of the federal act apply only where "the flow of interstate commerce sufficiently dominates." Several states have recently taken steps to provide similar encouragement to intrastate collective bargaining, and Massachusetts, New York, Pennsylvania, Utah, and Wisconsin have enacted state labor board acts, in which state boards are established and authorized to determine proper bargaining units, to designate approved bargaining agencies, to hold elections, and to prevent specified unfair labor practices in a manner similar to that prescribed for the National Labor Relations Board.

State acts are modeled closely after the federal legislation. They generally provide for an administrative board similar to the national board, and they give the state boards similar authority and responsibilities. They are empowered to de-

fine bargaining units and to hold elections for the purpose of designating bargaining representatives, and they are instructed to prevent the unfair labor practices described by the acts. In Wisconsin, in addition, the board is given extensive responsibilities as a mediatory agency. Only in the New York law is an employer given the right to call for an investigation to determine proper bargaining representatives for his employees. In all other acts, the right of appeal to labor boards is expressly limited to workers. The New York act also makes it a criminal offense punishable by a fine of not more than \$5000 or by imprisonment of not more than one year, or both, to "in any manner interfere with the free exercise by employees of their right to select representatives in an election directed by the Board."

As has been pointed out in the preceding chapter, the state laws generally prevent company unions from achieving the status of recognized bargaining agencies. That is a reflection of the doctrine that holds employer domination to be an unfair labor practice. In general, the state laws prohibit the same unfair practices as those enumerated by the federal act, although those of New York and Wisconsin specifically mention the use of industrial spies and blacklists. The Massachusetts law is distinctive in its inclusion of the sit-down strike as an unfair labor practice. Its section 8a provides that, "It shall be an unfair labor practice for any person or labor organization to seize or occupy unlawfully private property as a means of forcing settlement of a labor dispute."

State acts generally follow the precedent established by the National Labor Relations Board in its R.C.A. case in August, 1936, in requiring that if a union is selected as a bargaining agent in an election conducted by the Board, it must receive a majority of all eligible votes, not merely a majority of the votes cast in the election.

Historic aspects of collective bargaining. Collective bargaining is distinctly a development of the modern industrial era. In the period that directly preceded the intro-

duction of the factory system, as has been noted in Chapter II, there was nothing in the relationship of employers and employees that closely resembled modern collective bargaining. Craftsmen of many trades were organized, but their organizations, the guilds, included both employers (master craftsmen) and employees (journeymen and apprentices). The earliest real collective bargaining units were journeyman or yeomanry guilds, which appeared, for the most part, late in the handicraft period, when admission to the status of master craftsman became increasingly difficult. As tools became more complicated, greater capital was needed to set up an establishment, and, at the same time, the masters sought to restrict production by increasing the requirements for admission to their ranks. When journeymen found the doors to advancement closed to them, the natural result was organization to protect their interests in the situation.

In this country, the guild system was never extensive, but small local associations of journeymen appeared in colonial times. It is said that the earliest union was that of the cordwainers in Philadelphia in 1792. Several attempts at more extensive organization were made, but none was particularly successful until the middle of the last century, when national unions of typographers (1850), stone cutters (1853), hat finishers (1854), and several other skilled trades were formed. It is estimated that, by the end of the Civil War, at least thirty-two such organizations were in existence.

The Civil War encouraged coöperation among unionists at the same time that it forced a relaxation of employer opposition to them, and immediately following the war, attempts were made to perfect nation-wide associations of an inter-trade nature. Earlier organizations on a national scale had included only members of a single trade; the newer organizations sought to cement the bonds among trades. The first of these associations was the National Labor Union, formed at Baltimore in 1866. It was an association of city central bodies, each of which was composed of representatives from several local craft unions. Because of its de-

pendence upon these city federations, many of which were weak, it was highly decentralized in authority, and it did not prove effective.

Three years later, in Philadelphia, another attempt at amalgamation was made in the formation of the Knights of Labor. It had a highly centralized authority, and it proposed to include not only the members of existing craft organizations but also all other types of skilled and unskilled labor. Leadership in the movement was assumed by the garment cutters, and centralization of control was provided by an organization in which local unions were subject to district councils, and the latter were, in turn, responsible to a central administrative body. The organization increased rapidly in size, and it reached a maximum membership of 703,000 in 1886. Thereafter, as a result of several unsuccessful strikes and the diversity of interests featuring its numbers, the organization declined as rapidly as it had developed.

American Federation of Labor. Meanwhile, in 1881, preliminary steps were taken toward the organization of the American Federation of Labor, which was formally instituted in 1886. From its inception, it differed greatly in nature from the National Labor Union and from the Knights of Labor. It was created as a voluntary federation of craft unions. The vast majority of authority was retained by the sovereign national craft unions, and only that specifically delegated to the Federation could be exercised by it. No attempt was to be made to secure members from unskilled trades, and the whole organization was in many respects similar to the governmental structure provided by the Articles of Confederation by which our first national government was established.

The American Federation of Labor did not grow rapidly, but it expanded consistently, as is indicated by Figure 35, which shows the annual membership of affiliated unions from its beginning up to the most recent date for which such information is available. From time to time, certain

unions have relinquished their affiliation, but the federation's growth continued until after the close of the World War.⁴

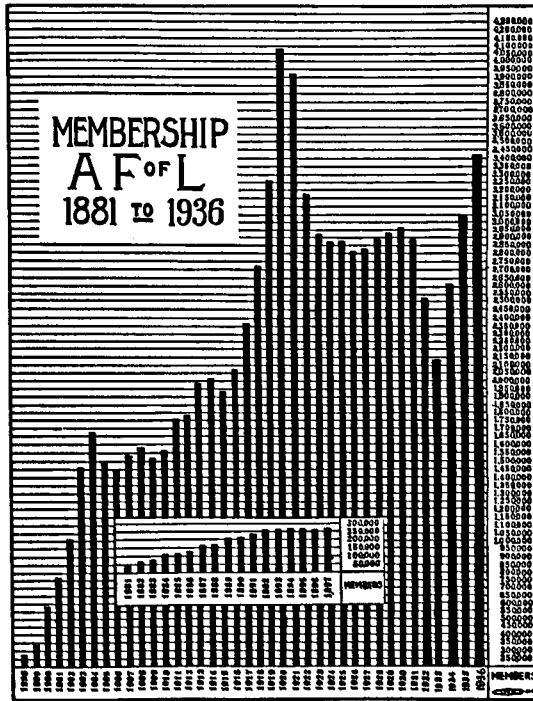


Fig. 35.—Annual Membership of Unions Affiliated with the American Federation of Labor. (Source: *Report of the Proceedings, American Federation of Labor, 1936*, p. 42.)

⁴See, Duffy, Frank, "Workers' Organisations of America," *American Federationist*, August, 1932, Vol. 39, No. 8, pp. 882-890.

The predominance of the Federation as a factor in organized labor in the United States, as late as 1935, is indicated not only by the fact that it included among its affiliated unions some 3,400,000 of the 5,000,000 organized workers but also by the prominence of affiliated unions among those for which workers voted in National Labor Relations Board elections at that time. This aspect of the results of such elections is summarized in Table XXIII.

TABLE XXIII

NUMBER AND PER CENT OF UNITS AND OF VOTES WON BY UNIONS, CLASSIFIED BY AFFILIATION OF UNIONS, JULY 10, 1934, TO JUNE 16, 1935

Union	Units Involved			Number of Employees Eligible To Vote	Valid Votes Cast		
	Number	Units Won by Unions			Total	Votes for Unions	
		Number	Per Cent			Number	Per Cent
All elections.....	579	337	58.2	56,814	45,287	26,478	58.5
Unions affiliated with American Federation of Labor.....	534	302	56.6	52,186	41,683	23,961	57.4
Int'l. unions.....	495	270	54.5	38,405	30,889	17,161	55.6
Fed. labor unions..	39	32	82.1	13,781	10,794	6,800	63.0
Independent unions...	45	35	77.8	4,628	3,604	2,517	69.8

Source: Wheeler, George Shaw, "Employee Elections Conducted by National Labor Relations Board, up to June 16, 1935," *Monthly Labor Review*, October, 1935, Vol. 41, No. 4, p. 958.

The growth of membership in the Federation is graphically portrayed in Figure 35, and the increasing number of affiliated nationals and internationals is shown in Figure 36. It will be noted, however, that the peak, as far as affiliations are concerned, appeared in 1910, when the Federation's affiliated units numbered 120, while membership was at its maximum in 1920, when there were 4,200,000 members.

The same year marked the highest point, prior to the recovery program of the Roosevelt administration, in union membership as a whole, as is shown in Table XXIV.

The American Federation of Labor became affiliated with the International Federation of Trade Unions on July 3,

TABLE XXIV
AMERICAN TRADE UNIONS, TOTAL MEMBERSHIP, 1897-1934

Year	Average Annual Membership	Year	Average Annual Membership	Year	Average Annual Membership
1897	447,000	1910	2,140,500	1923	3,622,000
1898	500,700	1911	2,343,400	1924	3,536,100
1899	611,000	1912	2,452,400	1925	3,519,400
1900	865,500	1913	2,716,300	1926	3,502,400
1901	1,124,700	1914	2,687,100	1927	3,546,500
1902	1,375,900	1915	2,582,600	1928	3,479,800
1903	1,913,000	1916	2,772,700	1929	3,442,600
1904	2,072,700	1917	3,061,400	1930	3,392,800
1905	2,022,300	1918	3,467,300	1931	3,358,100
1906	1,907,300	1919	4,125,200	1932	3,144,300
1907	2,080,400	1920	5,047,300	1933	2,973,000
1908	2,130,600	1921	4,781,300	1934	3,608,600
1909	2,005,600	1922	4,027,400		

Source: Wolman, Leo, *Ebb and Flow in Trade Unionism*, p. 16. New York: National Bureau of Economic Research, 1936.

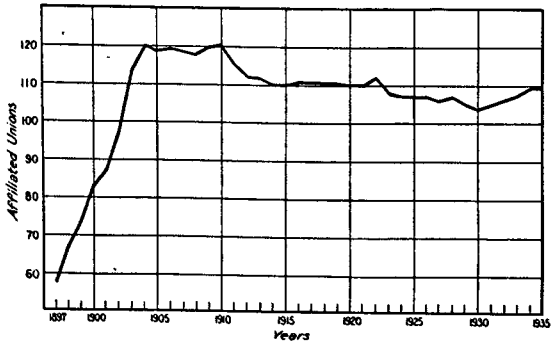


Fig. 36.—Number of National and International Unions Affiliated with the American Federation of Labor, 1897-1935. (Source: Wolman, Leo, *Ebb and Flow in Trade Unionism*, p. 18. New York: National Bureau of Economic Research, 1936.)

1937, after having remained outside that organization since the World War.

Unions outside the Federation. While the Federation has long represented a majority of all organized workers in the United States, there have always been independent unions that have not affiliated with it. The 1936 *Handbook of American Trade Unions*, for instance, lists a total of 156 unions, of which number 110 are a part of the Federation. Affiliated unions include a membership of 3,967,582, and independent unions account for 687,740. For the most part, and until the emergence of the Committee for Industrial Organization (to be described shortly), the independent unions have been made up chiefly of railway, textile, and postal workers. Numerically most important among independent unionists are the railway workers, with some twenty unions, of which the big four brotherhoods of conductors, engineers, firemen, and trainmen have long taken the leadership.

Radical unionism. Revolutionary unionism has never been particularly important, so far as the number of workers involved are concerned, in the United States. The Industrial Workers of the World, formerly the most important numerically of the revolutionary unions, probably included some fifty to sixty thousand dues-paying members at its peak. In recent years, it has completely disappeared. A later revolutionary organization, the Trade Union Unity League, was organized in 1929. It was chartered by the Red International in Moscow and represented a federation of left-wing unions. It appeared to prosper for a brief period, but it disbanded in 1935, after urging its members to join the conservative unions and seek to attain revolutionary objectives through them. Its membership included the National Miners' Union, the National Textile Workers, the Needle Trades' Workers Industrial Union, the Marine Workers Industrial Union, the Food Workers Industrial Union, and the Steel and Metal Workers Industrial Union. It sought recruits principally in mass production industries.

Maximum membership was attained in 1934, when the League reported 125,000 members.⁵

Committee for Industrial Organization. Recently, an almost spectacular development within the American labor movement has been signalized by the campaign of the self-styled Committee for Industrial Organization. In essence, the program of the new association seeks the extensive organization of workers in mass production industries, such organization to follow industrial rather than craft lines. While craftsmen within such industries are welcomed into the new unions, special effort is directed toward the organization of semi-skilled and unskilled workers.

The Federation, although originally an association of craft unions, had opened the door to industrial unionism in its so-called "Scranton Declaration" of 1901, under which the United Mine Workers were admitted. By 1933, there were a number of unions, especially in the clothing trades, that were almost industry-wide in scope. Of the 107 national and international unions affiliated with the Federation, 25 represented pure craft organizations and 50 more represented combined craft unions. The remaining 32 were of mixed membership, and at least two of them were definitely industrial in scope.

Beginning in 1933, there was a determined movement on the part of a minority within the Federation to force the issue. When the movement began, the Federation referred its demands to its executive council, with instructions that the council should decide upon a plan of action. The council decided that the most satisfactory temporary program was one which organized workers in mass production industries in local industrial unions and affiliated such locals directly with the Federation. Once organized, it was believed that these locals could then be invaded by organizers from various national craft unions and divided up among the latter.

But industrial workers, although they were fairly readily

⁵*Cf. Handbook of Labor Statistics, 1936, pp. 423-426.*

organized into local industrial units, resisted efforts to be forced out of the latter and into craft unions. Industrial units appeared to be much more to their liking; they found an actual harmony of interests among the members. On the other hand, workers in radio manufacturing, for instance, found very little of interest to them in the affairs of the electricians union, which held jurisdiction over them by its charter.

Accordingly, in 1934, the Federation was again asked to perfect industrial unions in mass production industries and to charter them as permanent affiliates of the body. When the executive council appeared hostile to this proposal, it was expanded from 11 to 18 members, adding seven additional vice presidents, and the annual convention of the Federation authorized charters for industrial unions in automobile, cement, aluminum, and other mass production industries. In so providing for industrial unions, however, the convention did not repeal a constitutional provision requiring that charters shall not be issued without a clear definition of the jurisdiction of the new union (Section II, Article IV) and further stipulating that no charter shall be granted if the new jurisdiction conflicts with or infringes upon that of any present member of the Federation without written permission from the member so affected. Since the unions whose jurisdictions are infringed are those, in many cases, which have most actively opposed the new organizations, these provisions appeared likely to prevent many of the desired charters. In spite of this limitation, however, the Federation entered upon a campaign of organization in the mass production industries, and the executive council reported to the annual convention in 1935 that 1804 federal labor unions had been organized in the preceding two years. They were distributed as shown in Table XXV.

Dissatisfied leaders of the movement for industrial organization felt, however, that greater activity in this direction should appear, and the 1935 annual convention of the Federation was besieged by the advocates of industrial un-

ionism with demands that an active campaign be undertaken. A resolution redefining the Federation's position and favoring industrial unions was finally defeated by a vote indicating that approximately 36 per cent of the Federation's members favored such organization while the rest opposed it.

TABLE XXV
FEDERAL LABOR UNIONS ORGANIZED BY THE
A. F. OF L. IN 1933 AND 1934

Automobile.....	183
Rubber.....	69
Aluminum.....	17
Radio.....	12
Cement.....	27
Gasoline Station.....	66
Gas and by-product Coke.....	31
Lumbermen, Loggers, Sawmill and Timber....	133
Miscellaneous.....	1266

Source: *Report of the Executive Council of the American Federation of Labor to the Fifty-fifth Annual Convention, 1935, p. 73.*

Following this convention in 1935, the Committee for Industrial Organization was formed on November 10 of that year. It was an association made up of representatives of 8 national unions, members of the Federation, including the coal miners, typographical workers, amalgamated clothing workers, ladies garment workers, textile workers, oil and gas workers, cap and millinery workers, and the second of the Federation's industrial unions, the mine, mill, and smelter workers. Shortly, this group was joined by several recently formed organizations, including the flat glass workers, automobile workers, rubber workers, iron, steel and tin workers, and the American Newspaper Guild.

The Committee for Industrial Organization initiated an active organizational campaign at once. Its prestige was enhanced by the perfection of a powerful industrial union in rubber, by a series of successes in organizing steel workers, and by a fairly successful sit-down strike against the General Motors Corporation in January and February, 1937. Industrial unions found the sit-down technique es-

pecially valuable. It had been imported from France, and its first appearance in this country seems to have featured the disputes in the plants of the Goodyear Tire and Rubber Company in the early months of 1936. The device was especially valuable in the new campaign of industrial organization, because it overcomes the greatest weakness of industrial workers, that is, their replacement by substitutes or machines. Craftsmen cannot be readily replaced when they strike; they are limited in number, and they require months or years of training. With unskilled machine tenders, the opposite is true; new workers are generally available in large numbers, and their training is a matter of days only. The sit-down strike prevents such substitution and thereby effectively stops production, for which reason it is especially valuable in the organization of industrial workers.⁶

Management has found no satisfactory means of combatting the sit-down strike. Recent court decisions holding that such strikes are illegal appear to be receiving increasing support in popular opinion, and it is doubtless true that management will, in the future, secure court orders requiring immediate evacuation. That may not, however, prevent serious disorder with accompanying hazards to life and property.

Numerical strength of unions. Most recent figures indicate a membership of approximately four millions for the American Federation of Labor. Some members are affiliated with Canadian locals, however, and there is probably considerable overlapping in members claimed by the Federation and the C.I.O. As of September, 1937, the latter organization claimed 3,718,000 members in 32 affiliated unions. Eleven unions in textiles, automobile manufacturing, garment making, lumbering, rubber manufacturing, electrical manufacturing, steel mills, coal mines, transportation, and power plants represent, according to C.I.O. officers, some 2,765,000 members.

⁶ See, "Organized Labor Movement, 1929-1937," *Monthly Labor Review*, February, 1937. Vol. 44, No. 2, pp. 292-318.

It is quite impossible to present comparative figures as to the strength of labor organization in many European nations, since dictatorial governments have generally eliminated independent labor unions, substituting workers' associations in which membership is compulsory. In England, however, union membership had reached an all-time high of 4,842,000 in 1935. That figure represents one third of the fifteen million British workers. In this country, membership represents, at most, not more than 20 per cent of eligible labor.

Techniques of collective bargaining. The basic principle in all collective bargaining is control of the labor supply. The effectiveness of any union that specializes, as do most organizations in this country, in business unionism, is directly dependent upon its ability to control the supply of workers. To maintain this control, unions make use of a number of rather well-established devices or techniques.

One type of device is directed at the control of membership. It operates by means of membership requirements, initiation fees, and apprenticeship arrangements to hold membership at desired levels. Another device defines the jurisdiction of the union in such a manner as to provide a definite field of operation for its members. Then, by agreement with other unions, this field is protected against infringement. Jurisdictions are defined in terms of types of work to be done as well as in terms of the geographic area in which the union operates.

Still another union device is the closed shop or, if that appears impossible, the preferential union shop. In the closed shop, agreements are entered into with employers providing that no one but union members shall be employed. In the preferential union shop, it is agreed that unionists shall be employed as long as they are available, and non-unionists shall be given employment only when no union members can be secured. Both devices tend to prevent competition by non-union workers.

In collective bargaining, several commonly used tech-

niques require explanation. Reference is frequently made to *standardization*, a term which refers to the fact that union members are considered by classes or standardized groups in collective bargaining. They do not deal as individuals, and agreements refer to classes of standardized workers rather than to individual performance. *Recognition* of the union is also frequently mentioned. It means the agreement, on the part of the employer, to consider the union as the authoritative bargaining agent for its members. *Representation*, another frequently mentioned term, refers to the right of unionists to be represented, in collective bargaining, by whatever agents they may select. Generally, such representatives are not chosen from the ranks of local workers but may be specialists employed for that purpose by the national union.

The end-product of collective bargaining is the *collective agreement*, which is in the nature of a contract entered into by the union and the employers with whom it deals. Certain features of such agreements are fairly common and almost standardized. The agreement states the period for which it is to be operative, the types of workers to which it applies, the degree of closed shop arrangements to be enforced, provisions as to discharge, detailed statements of wages for different classes of workers, hours of employment, arrangements and methods of settling disputes, apprenticeship provisions, standards of working conditions, and miscellaneous provisions as to the introduction of new machines, privileges to be accorded union agents, and special features of the agreement.

One of the most common features of recent collective agreements is the stipulation of seniority provisions to be applied in time of force reduction. These provisions may or may not apply to all employees, and it is important, from the standpoint of management, that they shall apply only to full-time workers, since the original engagement of part-time workers may antedate that of more experienced workers. Also, it should apply only to those who have success-

fully passed a probationary period. Otherwise, casual labor may secure a preferred position over regular and much more valuable employees.⁷

All these detailed provisions are presumably worked out in joint conferences of management and union representatives. The resulting agreement, while not a contract, has many features of the latter. It is not a contract because it cannot be enforced at law, since the courts have consistently refused to enforce any labor contract on the grounds that such enforcement might constitute possible involuntary servitude. For this reason, it is said that the doctrine of "specific performance" is unenforceable in labor contracts.⁸

Legal status of union practices. Reference has already been made to the legal status of unions in and of themselves and to the transition that has featured the development of labor organization's present legal position. Question may reasonably be raised, however, as to the legality of the specific practices that feature the program of organized labor. Most frequently raised, in that connection, have been questions as to the legality of boycotts, picketing, and strikes.

No definite statements can be made as to just which of these practices are and are not legal, for their status is complicated. It has been defined, for the most part, not in statutory enactments, but by the decisions of the courts. In general, however, it can be said that *primary boycotts*, involving only the members of a single union, have been held to be quite proper. Secondary boycotts, involving workers other than those immediately concerned in the dispute between an employer and a union, have been held to be illegal. Similarly, while state regulations differ widely,

⁷Christenson, C. Lawrence, "Seniority Rights under Labor Union Working Agreements," *Temple Law Quarterly*, April, 1937, pp. 355-381.

⁸See, *Selected Book List: Trade Union History and Policies, and Labor Legislation*, Princeton, N. J., Industrial Relations Section, Princeton University, July, 1931; Millis, H. A., "The Union in Industry," *American Economic Review*, March, 1935, Vol. 25, No. 1, pp. 1-13; Palmer, G. L., *Union Tactics and Economic Change*, Philadelphia, University of Pennsylvania Press, 1932.

it is apparently the general intention that peaceful picketing shall be permitted, while that which, in the words of the courts, involves violence, intimidation, and coercion is not legal. Frequently, effort is made to keep picketing from becoming objectionable by limiting the numbers of pickets.

The legality of the strike is confused by numerous considerations. A sympathetic strike is likely to be regarded as improper, since it is closely akin to the secondary boycott. The purpose of the strike is frequently important, for some courts have regarded strikes for the purpose of improving working conditions as proper while those which appear predominantly as means of injuring an employer are regarded as illegal. The legality of the sit-down strike is not entirely clear, although one federal Circuit Court of Appeals has held that it is illegal and that an injunction ordering workers to evacuate the premises is proper.⁹ That decision may prove an important and definitive one, however, for it interprets recent Supreme Court decisions on the National Labor Relations Act to mean that local strikes may exert a sufficient influence in interstate commerce so that they may be subject to the jurisdiction of federal courts and federal antitrust statutes.

The National Labor Relations Act is not, however, the only recent legislation that may have an important bearing on the legality and effectiveness of union practices. The federal Social Security Act and state unemployment insurance legislation may also become involved. The federal act stipulates that state laws shall not require an unemployed person to accept employment where a strike is in progress. The question as to whether strikers are to receive benefits is, however, left to the states. That question may frequently be highly important in determining the effectiveness of a strike. In at least one state, the governor has instructed relief authorities to place resources at the disposal of strikers, and if the latter can collect unemployment benefits while

⁹ *Apex Hosiery Company v. Leader*, Circuit Court of Appeals for the Third Circuit, June 21, 1937.

striking, the advantage to unions is apparent. Two thirds of the state laws specifically deny benefits during any week in which unemployment is due to a labor dispute, and one state (Alabama) provides that no such week shall be included in the waiting period.¹⁰

It is frequently suggested that American states should provide legislation similar to the former Canadian Industrial Disputes Act. That law, originally enacted by the Dominion Government in 1907, applied only to public utilities and mines. For such employments, it provided that employers should make no change in working conditions without thirty days' notice to employees. At the same time, it required employees to give thirty days' notice of any intended strike. If, within the thirty-day period, either employer or employee requested an investigation of proposed changes, a commission was to make such investigation, and the *status quo* must be maintained until the investigation was completed and publicity had been given to its findings.

The original act was held to be *ultra vires* or unconstitutional by the British Privy Council in 1925, on the ground that the central government had legislated in a field reserved to the provinces. Since that time, however, it has been replaced by provincial laws which apply almost identical restrictions. The newer legislation has had the support of both employers and employees. The success of Canadian legislation has generally been attributed to the fact that its requirement of compulsory delay encourages mediation and conciliation, at the same time that the point of view of employees has received effective publicity and favorable interpretation at the hands of investigatory commissions, so that investigation has frequently if not generally encouraged higher wages, shorter hours, and other improvements in working conditions.¹¹

¹⁰ For a more extensive discussion of the legality of union practices, see Yoder, Dale, *Labor Economics and Labor Problems*, Chap. XVII. New York: McGraw-Hill Book Company, Inc., 1933.

¹¹ Selckman, B. M., "Law and Labor Relations," *Harvard Business Research Studies*, March, 1936, Vol. 23, No. 14.

It may be noted that the Canadian act does not require compulsory arbitration. Similarly, no British legislation requires this method of settlement. Great Britain provides six district boards and one central board for conciliation, but the awards of these boards are not compulsory on either party to an industrial dispute. In general, it may be said that English-speaking people have consistently opposed compulsory arbitration, and American organized labor likewise staunchly supports this position.

Managerial objections to collective bargaining. Many managements have deep-rooted objections to collective bargaining. In part, these objections are poorly founded, so that they amount to little more than prejudices. In part, on the other hand, they reflect real shortcomings in current collective bargaining. It is frequently insisted, for instance, that workers do not want collective bargaining, that they become involved in it only because of the pressure exerted upon them by agitators and organizers from outside, and that the chief motive behind such organization is the racketeering one in which potential members are seen as candidates for a shake-down in the form of regular dues. In general, however, no type of labor organization can long persist if there is not some desire for it on the part of a fairly large number of workers, so that if union membership is over-sold, the reaction is likely to be certain and severe. The very attitude of management in seeking to protect workers from exploitation is objectionable to many workers, since it reflects the paternalism they so persistently criticize. Further, it is extremely difficult to create a lasting demand for unionization unless there is already extensive unrest among workers.

It is also alleged that collective bargaining encourages an improper attitude on the part of workers, in that it sets them up in a bargaining position in which they are opposed to rather than cooperating with management. Particularly objectionable, from this point of view, is the tendency of organized workers to set maximum standards of production

and thus to limit output. The tendency of unions to impose such standards cannot be denied, but it must also be admitted that, in many cases, these limitations should probably have been enforced by management in the interests of workers' health. Moreover, they are exactly the type of restrictions on supply that management constantly imposes in its attempts to secure maximum profits under partly or wholly monopolistic conditions. In other words, the device is not limited to unions; it is a technique organization may well have learned from management. Finally, if it seriously interferes with the productivity and value of workers, that fact will, in the long run, force the removal of offensive limitations.

A more valid objection on the part of management arises out of one of the major weaknesses of labor organization, jurisdictional disputes which arise and internal conflicts between unions which occasion interruptions in production.

Another objection insists that the standardization imposed by unions makes it impossible to compensate efficient performance properly. This criticism is leveled primarily at standardization of output, since union wage standards generally set only minimum wages and do not prevent payment of premiums. It is true, however, that maxima of production may be enforced, in which case superior performance is prevented. Somewhat similar is the charge that unionization interferes with the flexibility of the working organization in that workers cannot be transferred about as they should be, making more difficult the introduction of changed productive techniques and new machines.

Again, a frequent criticism of present day collective bargaining is the charge that the collective agreement is a one-sided contract. It can be enforced effectively only upon the employer. He is the only legally responsible contractor. The union can neither be forced to fulfill its contract nor effectively charged for losses arising from its failure to perform its obligations. The fact that such contracts are not specifically enforceable upon labor has been explained by

reference to the established rule of the common law that forbids the requirement of specific performance on a labor contract. The second condition, that damages can be obtained in cases of non-performance only with great difficulty, follows because claims must be assessed against individual union members, since the unions are not incorporated. In recent years, labor organizations have taken a definite and spirited stand against incorporation. That position contrasts with their feeling at an earlier period, when there was widespread labor demand for the right to incorporate, a demand voiced by both the Knights of Labor and the earlier National Labor Union. Their agitation led to the passage of a federal statute in 1886 which provided for such incorporation. After the right was thus established, however, union sentiment changed, and incorporation has been persistently avoided. The act was repealed in 1932.¹²

The failure of unions to incorporate is closely related to many serious managerial objections to collective bargaining. Since unions are not incorporated, they do not have to make a public accounting of funds so that many managers feel that they are essentially "rackets" in which members' dues are placed in irresponsible hands. The general lack of responsibility thereby attained by unions is basic to a considerable portion of existing anti-union sentiment. The whole problem of the violently attacked and defended labor injunction is directly involved, since such injunctions have generally been granted on the ground that irreparable damage is threatened by union action, and the fact that unions cannot generally be held legally responsible for the actions of their members is held to justify the conclusion that such damage is irreparable. Recently, of course, the use of labor injunctions has been restricted by both federal and state legislation. The federal Norris-LaGuardia Act of 1932 prescribes rules governing the issuance of such orders by the federal courts. It requires that labor injunctions be issued

¹² See, "Historical Review of Trade Union Incorporation," *Monthly Labor Review*, January, 1935, Vol. 40, No. 1, pp. 38-44.

only after an open hearing at which cross-examination is permitted, thus forbidding the formerly common *ex parte* procedure to which strenuous labor objection had long been raised. It further provides that injunctions shall prohibit only such actions on the part of laborers as have been shown in the hearing to be hazardous, thus preventing the former all-inclusive restrictive orders. In 1937, twenty-two¹³ states had similar legislation imposing restrictions on state courts, and the United States Supreme Court held, in a five to four decision, that the state law of Wisconsin is constitutional.¹⁴

It has been widely urged, since the emergence of militant unionism as typified by many units of the young Committee for Industrial Organization, that labor unions be required to assume additional legal responsibility. Especially since the National Labor Relations Act has given unions increased freedom and governmental protection, many industrial leaders have indicated the feeling that legislation similar to the British Trade Dispute and Trade Union Act of 1927 should be enacted here. The British law, passed largely as a result of the general strike of 1926, establishes definite limits beyond which union action must not go. It does not require incorporation of all unions, and few British unions are incorporated. It does, however, encourage unions to register in return for certain privileges, and such registration includes a statement of purpose, a stipulated and formalized procedure for the designation of officers, and provision for an annual audit of the funds of the organization. The Act further declares general and sympathetic strikes that seek to coerce the government to be illegal, and it places all strikes by workers in public utilities, where such cessations involve a breach of contract, in the same category. If a union is found guilty of an illegal strike, damages may be assessed against its funds, and union officials may be held criminally

¹³ Arizona, Colorado, Idaho, Illinois, Indiana, Kansas, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Michigan, Montana, New Jersey, New York, North Dakota, Oregon, Pennsylvania, Utah, Washington, Wisconsin, and Wyoming.

¹⁴ In *Senn v. Tile Layers Protective Union, Local No. 5*, May 24, 1937.

liable for such strikes. Naturally, the Act has been severely criticized by representatives of labor, but it appears to have encouraged an orderly collective bargaining process. Whether or not similar provisions would be as effective in this country is, of course, a matter of conjecture.

Underlying many of management's objections to collective bargaining is the conviction that unions tend to interfere in what is regarded as the proper sphere of managerial authority. It is insisted that the determination of wages, hours of work, employment conditions, bases for discharge, seniority rights, the selection of sources of employees, and numerous other phases of industrial policy lie entirely within the sovereign sphere of managerial decision and action, so that union efforts to effect such policies infringe upon the proper function of management. In part, the contention can be reasonably supported, and there is real danger of lessened industrial efficiency if unions attempt to enforce unsound selection of new employees or unintelligent restrictions upon work and working conditions. On the other hand, however, it is entirely possible that, if employees are well informed as to the current problems faced by management, they may make significant contributions to the solution of such problems, and there is ample room for the cooperation of labor organization and management in the solution of numerous problems having distinct mutual interest.

Recent experience under the National Labor Relations Act and the procedure adopted by the National Labor Relations Board has given rise to a number of additional managerial objections to collective bargaining. One basic objection is aimed at the Act itself, criticizing its failure to allow an employer to petition for hearing and assistance in a labor controversy. The same limitation, it may be noted, characterizes all state acts excepting that of New York. As a result, the services of labor boards are available only upon petition of labor. In many cases, where two unions are seeking to force an employer to recognize each of them as the bargaining agent for all his employees, interruptions of work,

disorganization of employee relations, and property damage have resulted from such conflict. But the labor boards will not consider a petition from the employer who asks their services in determining bargaining representatives.

Frequently, also, there is serious and apparently legitimate objection to the National Labor Relations Board's general ruling that a majority of the employees in a designated bargaining unit shall select the bargaining representatives for the whole unit, that there shall be no proportional representation. It is argued that the rule enforces an improper disregard for the interests of minorities. On the other hand, it is well known that managements have frequently encouraged the development of two or more organizations among employees as a means of preventing one strong unit, so that the reasoning behind the Board's position is not without foundation. Recently, the Board has authorized proportional representation, but its membership was divided on the issue.

There is serious objection to the bargaining units designated by the federal Board in numerous instances. The Board has sought to take into account, in defining these units, the previous and traditional bargaining relationships within the plant and industry and numerous other similarly pertinent considerations, but there is an extensive feeling that it favors industrial rather than craft unionism and that its designation of units has frequently reflected this partisanship. Thus, in its National Electric Products Corporation case (September, 1937), the Board held a contract granting a closed shop to an A. F. of L. union null and void and ordered a plant-wide election, although the federal district court had held the agreement binding. In the subsequent election, employees selected the A. F. of L. union representatives by majority vote. The case has been frequently cited as evidence of the Board's partisanship, although the facts appear to indicate that the Board was suspicious of the representative character of the union because of management's ardent defense of the existing agreement. It is entirely

possible, however, for the Board to designate a bargaining unit that may destroy long-standing collective relationships and introduce serious discord in the ranks of employees, if, for instance, it holds the plant to be the proper unit, although there have been long-standing agreements between the management and particular crafts within the plant. In the General Steel Casting case, decided in October, 1937, the Board carefully indicated its regard for crafts as units and ordered an election on a craft basis. The decision followed bitter denunciation of the Board by the convention of the American Federation of Labor.

Objection is also raised to the interpretation that a written contract must result from the collective bargaining process as an evidence of good faith on the employer's part. This issue was fundamental in the steel strikes in the summer of 1937, although it has been raised in other connections as well. The Board clearly indicated its position in a release dated October 27, 1937, which declares:

Employers who negotiate with union committees and then refuse to embody the terms thus arrived at into a written, signed agreement with the union as such, are proceeding on a policy which is an adaptation of their anti-union attitude and which runs counter to the experience of collective bargaining. Where collective bargaining has been successful, it has, in almost all cases, been in the form of negotiation by representatives and consummation by the signing of an agreement between the employer on the one hand and the union as the collective bargainer on the other.

Many managements object, however, to signing a contract that they feel is enforceable only against them. They insist that the union, with its present legal status, is not a legally responsible bargaining agency. Further, they feel that if the Act is interpreted as requiring a written agreement, then it can be used to enforce almost any terms desired by labor as conditions in that agreement. In other words, if management must bargain until a written agreement is reached, then it can be forced to concede, ultimately, to almost any demands labor may make. Finally, it is held, circumstances may entirely justify an employer in seeking to avoid a writ-

ten agreement, if, for instance, he has customers who are seriously opposed to labor organization.

All these objections to features of collective bargaining that are closely associated with the interpretation of the National Labor Relations Act have become more significant as the courts have weighed and generally upheld the actions of the National Labor Relations Board. Sixteen of the first seventeen cases taken into court by the Board have resulted in decisions substantially supporting the Board's contentions. The sixteen cases involved 459 reinstatements, 214 of which included payment of back wages.

It is possible, of course, that the procedure of the Board may become less objectionable to management as its members gain experience in administering the law. The history of the Interstate Commerce Commission indicates that it takes time to develop a balanced and consistent procedure.

That many managements regard these objections or some of them seriously may be judged from the lengths to which they have gone in the past to prevent labor organization from gaining a foothold among their employees. Reference was made, in the preceding chapter, to the use of employee representation plans for this purpose. Sometimes managements have employed industrial spies to discover sympathizers and organizers among workers. Recent Senate investigations have disclosed that the practice was quite extensive during the last score of years. In committee hearings, the National Labor Relations Board presented evidence that approximately one third of the seven hundred detective agencies listed in fifty major cities "derive their principal income from industrial espionage and strike breaking." The report of the hearings indicates that "some 200 are specifically listed as doing this business exclusively or mainly."¹⁵

Managerial advantages. Collective bargaining is not, however, an entirely one-sided arrangement, even from the viewpoint of management. It has its advantages as well as its shortcomings. Many managements feel that the ad-

¹⁵ "Hearings on Senate Resolution 266," Washington, April, 1936: p. 62ff.

vantages greatly outweigh negative values, and they insist that they would not care to return to a system of individual bargaining under any circumstances. They point, for instance, to the fact that the collective bargain greatly simplifies dealings with workers, since one agreement determines wages, hours, and working conditions for large numbers of employees. At the same time, collective bargaining tends to encourage the self-development of employees, providing them with opportunities for leadership and recognition. Possibly, the most frequently mentioned advantage of such bargaining is the fact that it enforces uniform labor conditions among competing employers, so that no one of them finds it possible to secure great advantage over his fellows by lower wages and less satisfactory working conditions. This condition is, of course, only partly true, since there is usually room within the limits of collective agreements for various degrees of efficiency in the use of labor.¹⁶

Moreover, there is in well-established collective bargaining a possibility of providing for the orderly settlement of grievances and disputes that can scarcely be attained in any other manner. The provisions of the Railway Labor Act, held constitutional by the United States Supreme Court on March 29th, 1937, may be interesting in this connection. The Act provides that employees are to be allowed entire freedom, as far as association in unions is concerned, that no anti-union contracts shall be used, and that no company union membership shall be a condition of employment. The National Mediation Board, established by the Act, is authorized to determine who shall be the proper employee representatives in case of dispute. Changes in collective agreements can be made only if those desiring such changes give notice in advance. Any dispute that cannot be settled by the National Mediation Board must be referred to a special fact-finding board appointed by the President of the United States, and the *status-quo* must be maintained pend-

¹⁶ See, for instance, Randolph, A. Phillip, "Why a Trade Union: A Letter to the Pullman Company," *American Federationist*, December, 1930, Vol. 37, No. 120, pp. 1570-1582.

ing the investigation and for thirty days thereafter. Further, a special National Railroad Adjustment Board is created to dispose of individual disputes and grievances between employees and the carriers. The Act may well serve as a model for less inclusive agreements in other industries.

The fact that unions have frequently exerted a strong influence toward the improvement of working conditions and, at the same time, resorted to little in the way of force in securing these advantages for their members is clearly evidenced in the history of a number of the older and better established unions. The experience of the Amalgamated Association of Street, Electric Railway, and Motor Coach Employees of America is a pertinent illustration. Throughout half a century, the organization has enforced upon its locals a policy requiring arbitration rather than cessation of work, and leaders have persistently held that so long as management is willing to arbitrate, the strike is unnecessary and out of place.¹⁷ Other illustrations of collective bargaining in which it has proved an effective means of removing points of difference between management and employees over a long period might be cited.

Union-management coöperation. In some cases, collective bargaining has been carried considerably further than the mere agreement upon wages, hours, and working conditions. Under arrangements providing for what is usually described as union-management coöperation, the agreement between management and the union covers a wide range of managerial policies and allows union leaders a considerable voice in the determination and enforcement of practically all managerial policies.¹⁸

Union-management coöperative plans propose to secure the extensive coöperation of employees in the solution of managerial problems by allowing them full access to the facts with respect to such problems. They tend, in effect,

¹⁷Schmidt, Emerson P., *Industrial Relations in Urban Transportation*. Minneapolis: University of Minnesota Press, 1937.

¹⁸See, "Union-Management Relations in the Women's Clothing Industry, New York Industrial Area," *Monthly Labor Review*, July, 1936, Vol. 43, No. 1, pp. 24-33.

to make the union a partner in the business, allowing it to exert extensive control in return for its recognition of the managerial problems necessarily involved in industrial relations. The usual mechanism by which these arrangements are effected is the union-management coöperative committee, made up of representatives of the union and of management. The committee's primary purpose is not collective bargaining but, rather, the analysis and solution of managerial problems. In practice, these committees have employed production engineers and other technical consultants and personnel counselors, as well as all the technical equipment available to modern management to improve the efficiency of production. When the committee has decided upon a course of action, it proceeds to interpret the whole program to employees.

Numerous illustrations of the effectiveness of union-management coöperative arrangements might be cited, although the depression naturally placed tremendous stresses upon arrangements that, in many cases, were in only formative stages. One of the oldest and most successful of these associations is that of the Canadian National Railways. Another is the system in use in the shops of the Baltimore and Ohio Railroad since 1923. They are not, however, confined to any one type of industry. An arrangement involving the United Mine Workers of America and the Rocky Mountain Fuel Company has been in operation for several years, and others are to be found in clothing, textile, upholstering, carpet weaving, glass, and many other industries.¹⁹

Evaluation of collective bargaining. A little factual evaluation of collective bargaining would frequently represent a vast improvement over the usual opinionated expres-

¹⁹ For details of the operation of these and other such plans, see, Hardman, J. B. S., "Labor-Capital Cooperation," *Encyclopaedia of the Social Sciences*, 1935 edition, Vol. VIII, pp. 624-629; Brown, G. C., "Workers' Participation in Management," *Bulletin of the Taylor Society*, February, 1929, Vol. 14, No. 1, pp. 11-28, and "The Union-Management Coöperative Committee," *American Federationist*, June, 1930, Vol. 37, No. 6, pp. 674-675; Goodell, Frances, "Joint Research—The Technician's Point of View," *ibid.*, March, 1930, No. 3, pp. 292-301; O'Connell, John P., "A Case of Employer-employee Cooperation," *ibid.*, March, 1930, pp. 287-291; Smith, J.

sions by which it is characterized. It is essential that management seriously consider both its advantages and its shortcomings in specific situations. What are its effects upon production? How is it fitting in with sound managerial policies? Where is it interfering with sane and efficient features of a well-rounded managerial program? What are its effects on individual workers? In what way can unions improve the efficiency and value of their members? How do union and non-union workers compare as to punctuality, productivity, earnings, absences, accidents, promotions, length of service, and other significant indexes of satisfactory performance? When the answers to these and other similar questions are known, and only when they are known and not just surmised, can the values of collective bargaining be correctly measured and constructive suggestions for increasing that value be made. Few unions, on the other hand, can afford to ignore conditions that interfere with the efficiency of their members, but they can scarcely be expected to place any great weight on managements' personal prejudices and their reflections in minor criticisms and vague suspicions. Moreover, management may frequently be surprised to find that many unions have effected fairly satisfactory selective programs and have regulations that provide for positive rather than negative effects on employee efficiency. As it becomes increasingly necessary to deal with unions (and that would seem to be the trend of the present), both management and union leaders may be expected to give more attention to such considerations, for conditions associated with inefficient performance are objectionable from every point of view. Management

Foster, "Union-Management Cooperation at Naum Keag," *ibid.*, March, 1930, pp. 281-286; Smith, J. Foster, and O'Connell, John P., "Cooperation in Pequot," *ibid.*, November, 1930, No. 11, pp. 1341-1352; Richardson, J. H., "Recent Developments In Industrial Cooperation in the United States and Canada," *International Labour Review*, July, 1929, Vol. 20, No. 1, pp. 67-93; Thomas, A. J., "The Union-Management Cooperation Plan on the Canadian National Railroad," *Personnel*, November, 1928, Vol. 5, No. 3, pp. 219-225; Thompson, Laura A., "Union-Management Cooperation,—a list of references," *Monthly Labor Review*, October, 1928, Vol. 25, No. 4, pp. 936-943.

must probably take the initiative in such analysis, however, since it is better prepared by training and experience.

Strangely enough, many managements apparently overlook the fact that the effects of collective bargaining upon industrial relations and productive efficiency reflect, to a considerable degree, the spirit in which management enters the bargaining relationship. When employers undertake collective bargaining unwillingly and with an obvious desire to begrudge every step in the process, no objective observer could expect that a fine, coöperative enthusiasm would characterize the workers who emerge from the process. If management is forced to conclude the agreement only by the threat of continued strikes, if it concedes employees' rights to bargain collectively only because it is forced to do so, as was the case when certain automobile manufacturers were coerced into collective bargaining in the spring of 1937, the ensuing relationship is unlikely to prove particularly satisfactory. If, on the other hand, management bargains collectively without obvious prejudice, if it indicates a willingness to coöperate in the process instead of stalling, if it "lays its cards on the table," then an entirely different reaction may be anticipated from employees.

The usual answer from anti-union employers is, of course, that their opposition to dealing with organized labor is based primarily on the fact that so many unions are no more than "rackets," that management's objective is primarily to protect employees from being forced to pay tribute to "racketeers" who organize and control the unions for selfish reasons. They cannot, they insist, leave faithful employees at the mercy of such unscrupulous exploiters.

That unions may sometimes be little more than enforced associations founded for the personal aggrandizement of their organizers cannot be denied. On the other hand, if a majority of employees wish to affiliate with and be represented by a union, its character may reasonably be left to them, since, after all, they pay the dues. In the long run, if it is not worth while, they will reorganize or leave it. The history of numerous labor organizations indicates that they

cannot persist and maintain their membership if they do not hold the confidence of their members. Management can, therefore, afford to allow workers to appraise the quality and value of their affiliations, being firmly assured that the most objectionable types of organizations are short-lived. Moreover, in a society that claims to believe in and adhere to the principles of democracy, the theory of majority rule in the selection of representatives has ample precedent.

Exercises and Problems

1. Explain recent tendencies toward more widespread collective bargaining in the United States.
2. What are the "unfair labor practices" described by the National Labor Relations Act?
3. What is meant by standardization? recognition? representation?
4. Describe the basis for the present conflict between the A.F. of L. and C.I.O.
5. Describe the legal status of the most common union practices.
6. Outline the advantages and disadvantages of collective bargaining as viewed from the standpoint of management.
7. Compare unionists and non-unionists as to the significant characteristics summarized in the following tables. Are there significant differences? Use such techniques as the σ_D , bi-serial r , and others that may appear appropriate.

Earnings of Unionists and Non-Unionists

<i>Weekly Wages</i>	<i>Unionists</i>	<i>Non-Unionists</i>
\$15-20	41	66
20-25	73	125
25-30	95	152
30-35	120	192
35-40	140	224
40-45	26	41

Promotions of Unionists and Non-Unionists

	<i>Unionists</i>	<i>Non-Unionists</i>
Promoted	55	122
Not Promoted	445	678

Ratings of Unionists and Non-Unionists

<i>Ratings</i>	<i>Unionists</i>	<i>Non-Unionists</i>
50- 60	70	86
60- 70	85	95
70- 80	240	147
80- 90	103	431
90-100	2	41

8. Using the methods of the bi-serial r and bi-serial η , measure the significance of the relationship between union membership and average weekly sales as shown in the following tabulation:

<i>Sales in \$100</i>	<i>Unionists</i>	<i>Non- Unionists</i>
1-3	10	40
3-5	20	60
5-7	45	500
7-9	25	300

Collateral Reading

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CHAPTER XXII

Service Functions

MANY personnel departments are charged with responsibility for various so-called *service functions*, in which management seeks to improve the efficiency of workers by assisting them in a variety of ways to meet current personal problems. Sometimes, these activities of the personnel division are lumped together as "welfare" functions, and many of them have closely paralleled the social work generally carried on by community social agencies. There are, however, two fairly distinctive types of service functions. One type is undertaken in a spirit of charity and benevolence. It smacks of the middle class humanitarianism that characterizes much non-professional social work. The other type has little of this attitude behind it; its purpose is to assist employees to be more efficient in their work and to provide such services as appear likely to operate in that direction. It involves no conception of charity but holds that the only services that are worth while are those that pay, directly or indirectly, in increased efficiency in the use of labor. The first type of function may reasonably be regarded as welfare work.

Managerial welfare activity is in disrepute with both employers and employees in the United States. It was more appropriate in the period when popular opinion approved of the paternalistic employer who "looked after" his employees. Today, most employees resent that attitude, insisting that they prefer to live at a level where they can look after themselves. The fact that many workers are quite incapable of making adequate provision for themselves and their families is not regarded by most workers as justifying

managerial paternalism. It is not surprising, therefore, that most alert managements have discontinued these activities.

The second type of activity has, however, continued and expanded in recent years. It is worth while from every point of view, and both management and men approve it, although some of its major functions have recently been taken over in whole or in part by government. It is this second type of services to which major attention is given in this chapter.

The extent of these services provided employees by various concerns naturally varies greatly from one management to another. Some concerns have long-established and extensive facilities and services of this sort. Others provide almost none. Epstein¹ concluded, in 1932, as a result of a survey of 514 corporations employing some 3,075,034 workers, that these concerns spent an average of \$17.04 per employee in the provision of such services, in which he included pensions, mutual benefit plans, group insurance, employee stock ownership, and unemployment benefits. It is likely that this amount was greatly increased in the depth of the depression and reduced accordingly as business and employment regained lost ground in the recovery period. The National Industrial Conference Board surveyed personnel activities in 2,452 concerns employing 4,502,608 employees in 1935² and found that, for the most part, the service provisions were considerably more extensive than they had been in 1927 in the same or similar firms.

Types of services. Because services are so varied, no classification is entirely satisfactory, but the most important and commonly provided of them may be outlined as follows:

1. Health and recreational facilities, including medical and nursing services, gymnasia, swimming pools, clubhouses, and similar facilities.

¹ Epstein, Abram, "Employees' Welfare: an autopsy," *American Mercury*, March, 1932, Vol. 25, No. 99, pp. 335-342.

² *What Employers Are Doing for Employees*, p. 26. New York: National Industrial Conference Board, 1936.

2. Direct financial assistance, including credit at company stores, coöperative purchasing, company housing and transportation.
3. Indirect financial assistance through mutual benefit associations, credit unions, savings and building and loan associations.
4. Insurance (particularly group life insurance) and retirement pensions.

The one common feature of all such services is that they have been established and are approved and assisted by management, which generally subsidizes them in one way or another and which is ordinarily represented in their administration.

Health services. Most of the health services provided by management are outgrowths of accident prevention programs or group insurance provisions. Recently, the rapid extension of workmen's compensation to include industrial disease has given an additional stimulus to these activities. Services may be limited to a preliminary medical examination, or they may include the prescription of treatment for remediable physical defects, hospitalization for ill or injured employees, educational campaigns designed to improve and maintain the general health of employees, and nursing services, including home visitation, first-aid instruction, dental care, and other specialized provisions. In some cases, employees contribute to the cost of these services. In others, all costs are borne by management.³

The wide range and variety of health services that are provided reflects differing needs in individual plants. Location, for instance, accessibility to existing medical and dental facilities of high quality, is an important consideration. The type of work performed is similarly significant; certain occupations have few health hazards, while others have many. Another important consideration is the work-

³See Davis, Eleanor, *Company Sickness Benefit Plans for Wage Earners*. Princeton: Industrial Relations Section, Princeton University, 1936.

ers' attitude toward such services. If they are widely regarded with suspicion and believed to be a means by which management seeks to pry into the personal affairs of employees (as is often the case where visiting nurses are employed), then the services should be restricted to a minimum. If accidents are numerous or serious, then the preventive aspects of the health program may be stressed, including especially first-aid instruction and accident prevention practices. The comparative importance of these provisions in the survey made by the National Industrial Conference Board is shown in Table XXVI.

TABLE XXVI
TYPES OF INDUSTRIAL HEALTH SERVICES⁴

Service	% of Companies Providing Service
Medical services of all types	65.2
Dental clinic	4.6
Dispensary or hospital	47.1
Organized first aid	54.2
Health preservation	14.9
Plant nurse	35.4
Visiting nurse	14.9
Optical clinic	7.3
Physical examinations:	
New employees	45.8
Periodic	19.2
Type not specified	0.8
Physician:	
Part time	19.9
Full time	9.6
On call	38.0
Type not specified	0.2

These services as a whole were most common in concerns employing from five to ten thousand employees, and, as might be expected, they were considerably less common in small than in larger plants.

Recreational services. The numbers and types of recreational services that may be justifiable depend largely on the location of the plant. If there are numerous facilities of a

⁴ *What Employers Are Doing for Employees, op. cit., p. 16.*

similar nature available in the community, there is little reason for management to provide them. If, on the other hand, the plant is located in a small community where such facilities are not available, then they may meet a genuine need. The nature of the work is also an important consideration in determining what types of recreation may be most appreciated. Many firms find athletic contests most popular, while others discover extensive employee interest in musical, dramatic, and social activities. No general rules can be described, but it may be said that caution should be exercised so that workers are not forced into activities in which they have little or no real interest.

An excellent sample of existing provisions of this sort is available from the National Industrial Conference Board study to which reference has been made. The study lists, as major features of such recreational programs, athletics, clubhouses, dances, dramatics, gardens, musical organizations, picnics or outings, summer camps, holidays with pay, noon-day recreation, recreational facilities, and vacations with pay. Of these, the most common are vacations with pay (82.5 per cent of all concerns had such arrangements for specified groups of workers), holidays with pay (78.8 per cent), athletic programs (47.1 per cent), picnics or outings (33.3 per cent), dances (21.1 per cent), and clubhouses (17.3 per cent). It is interesting to note, as an indication of prevailing tendencies in this connection, that the most commonly discontinued services include musical organizations, summer camps, and dramatics. As a whole, such services more commonly appear only in the larger organizations.

Direct financial assistance. Provision of company stores, lunchrooms, houses, and other similar services for employees may be a desirable function of management under certain conditions. Where the motive is not exploitation, it is generally assumed that these facilities save money for employees. Many firms feel that company stores and lunchrooms, like company houses, force prices and rents down

throughout the community. Moreover, an effort may be made to teach employees thrifty buying habits and to see that they get the food or other values they really need. Sometimes these business ventures are operated entirely by management; sometimes they are coöperative and employees own shares and profit from dividends as well as reasonable prices. Many firms operate lunchrooms and stores at cost on the theory that their employees are better fed and more efficient because of these services.⁵

The 1935 survey conducted by the National Industrial Conference Board found that 38.1 per cent of all firms had lunchroom facilities, 59.5 per cent provided parking facilities, 10.9 per cent provided for coöperative purchasing, 5.1 per cent maintained a company store, and 2.0 per cent supported a coöperative store for employees. As a whole, these services were most common in mercantile, banking, insurance, public utilities, clothing, foods, iron and steel, rubber, and textile industries, and they are noticeably centered among the larger business units.

Many states have been so impressed with the tendency of company stores to take advantage of workers that they have enacted legislation limiting the activities of such ventures. Generally, this legislation does not regulate the actual storekeeping but is directed against the issuance of "scrip" to employees in lieu of money wages. Such "scrip" is customarily redeemable only at company stores or lunchrooms. Other laws (in 17 states) prohibit coercion on the part of an employer by which a worker is forced to trade at a company store. Twenty-four states regulate the use of scrip in this connection.⁶

Employee attitudes may readily determine whether such facilities are an asset or a liability. If employees feel that they express a paternalistic attitude on the part of manage-

⁵ See, *Industrial Lunch Rooms*. New York: National Industrial Conference Board, 1928.

⁶ See, Creamer, Daniel, "Legislation on Company Stores in the United States," *American Federationist*, April, 1936, Vol. 43, No. 4, pp. 365-375.

ment, the reaction may be so adverse as to cancel any advantages, and the same result will prevail if employees feel that they are being exploited in company stores, lunchrooms, or houses.

Employers' experience in housing illustrates these principles. Many motives explain these housing provisions. In numerous cases, they have recognized the fact that rent is an important element in living costs, amounting to approximately 20 per cent of the wage-earner's budget, and they have sought to assist their employees by providing cheap housing.⁷ In other cases, of course, housing has been a necessity because plants or operations require workers to leave existing facilities, and in still others, housing has been used to secure a better quality of labor than would be available if such provision were not made. Many impressive housing developments reflect these conditions, including Morgan Park, Minnesota, and the several villages of the Colorado Fuel and Iron Company.

On the other hand, much of management's experience with such ventures is highly unsatisfactory. The Pullman Company provided the city of Pullman, only to find that employees objected to living too close to fellow workers. In many cases, employees have failed to take proper care of the homes thus provided, and they have often objected to supervision by management and to the scrutiny of neighbors who are also fellow workers.

Mutual benefit associations. Many firms have found that mutual benefit associations fill a real need. They provide benefits for exigencies that are beyond the coverage of workmen's compensation, including disability occasioned by accidents outside employment, illness that is not attributable to occupation, and death from natural causes. To some extent, they take the place of health and life insur-

⁷ The housing survey conducted by C.W.A. workers in 1934 indicates that there has been and is genuine need for assistance in many localities. From the survey, it was concluded that about five million new dwelling units were seriously needed in the United States. The survey included some 3,300,000 dwelling units in 1,728,000 dwelling structures.

ance, both of which have definite deficiencies, as far as workers are concerned. Health insurance, for instance, is too expensive for most workers, and workers' life insurance is often allowed to lapse, especially when employment is irregular. Moreover, the usual employee policies have no surrender privileges.

Mutual benefit associations are copied rather directly from trade union benefits, and the latter represent a feature of earlier guild organizations. In the period immediately following the World War, many managements began such provisions. The National Industrial Conference Board reported some 700 to 800 funds in operation in 1923. In 1926 and 1927, the Bureau of Labor Statistics found that 214 of 430 manufacturing firms reporting to the Bureau had such provisions. Moreover, in 127 firms having approximately a million employees, where management assisted in maintaining and administering the funds, 76 per cent of all employees were affiliated with the associations. The 1935 survey undertaken by the National Industrial Conference Board found that 28.2 per cent of all firms had mutual benefit associations.

A study by the Industrial Relations Section of Princeton University in 1929 indicated that membership in these associations is generally voluntary, although it may be compulsory for all employees or there may be some feeling that management expects if it does not require membership. In many cases, there is an age limit for affiliation, the most common being 50 years. Sometimes, a physical examination is required. There is usually a small initiation fee, and monthly dues of from 25 to 75 cents are common. In many cases, they are deducted from wages. They may be scaled according to wages, and they vary with the amounts and variety of benefits provided. The most common benefits are those for sickness, accident, and funeral expenses. Sickness and accident benefits range from \$8 to \$25 per week, and death benefits are generally small, seldom exceeding \$200. Frequently, more extensive allowances to

dependents are provided. There may be a waiting period for certain benefits, but generally there is none, in which case the benefits frequently assist workers during the waiting period required by compensation laws.

Management's participation in the programs takes a variety of forms. It ordinarily includes membership on the joint committee that administers benefits. Financial contributions by management vary widely, from 10 to 50 per cent of total costs of programs. Generally, total expense to management is not in excess of 1 per cent of the payroll.³

If the need for such an association is clear, management's chief interest is in its soundness. Many plans have required frequent readjustment or additional and unexpected subsidies from parent firms because they were not established on a basis that took account of all probable liabilities. It is essential, therefore, that something approximating an actuarial study be made as a preliminary step. It should note the ages, sexes, and occupations of employee members, since accident and disease vary with these conditions. Thus, the death rate at age 50 is 2½ times that at age 30, while the sickness rate at 50 is twice that at age 30. Similarly, the sickness rate for females is approximately twice that of males of the same age. For this reason, employees must be carefully classified, and records of sickness, accidental injury, and death are of great value.

Such information is particularly important if death benefits are to be provided, and they are probably the most common of all types of benefit. The National Industrial Conference Board found, in its 1923 study of these associations, that 323 of 382 associations provided death benefits, which ranged from \$12.50 to \$5000. If death or retirement benefits are to be provided, careful recognition must be given to any tendency for the age distribution of members to change.

³See, *Present Status of Mutual Benefit Associations*, New York, National Industrial Conference Board, 1931; Brundage, Dean K., "Survey of the Work of Employees' Mutual Benefit Associations," *Public Health Reports*, Vol. 46, pp. 2102-2119; "Memorandum: Mutual Benefit Associations," Princeton, Industrial Relations Section, Princeton University, 1929.

Commonly, this average tends to increase, because too few new employees are taken in at low ages to compensate for the aging of members. When this is true, reserves must be established against a future increased load.

In determining upon types and amounts of benefits, the most important considerations to be taken into account are (1) the amounts employees can contribute, (2) the extent to which management is willing to subsidize the program, (3) the types of workers involved, (4) the types of benefits desired, (5) the waiting period to be enforced for each type of benefit, (6) the scale of benefits desired and the length of benefit periods. Each of these considerations must be evaluated carefully in formulating the plan, for each is directly related to the complete system. Solvency in a benefit association is the prime requisite, and it depends directly on a proper balancing of these factors. For instance, it has been calculated that, with an average aged group of male workers, monthly charges of \$1 could provide a sickness benefit of \$15 per week for 13 weeks each year, with a one-week waiting period.⁹ If the waiting period is removed, the costs would rise approximately 35 cents per month.

It is highly desirable that plans be so carefully founded that assessments will be unnecessary. Because of the detailed analysis that is clearly necessary, many firms have come to the conclusion that it is more satisfactory to employ established insurance companies to provide death benefits and to limit mutual benefit association coverage to accidents and ill health.

Employee savings associations. Many firms have sought to assist employees in saving, to encourage thrift, to provide facilities for small loans to workers, and, to some extent, to inform interested employees as to sound investment principles by assisting in the formation and maintenance of employee savings associations.

That workers have considerable interest in such pro-

⁹ Woodward, J. H., "Financing Benefit Systems," American Management Association, Convention Series, No. 8, 1924, p. 15*f*.

visions may be inferred from the fact that organized labor has entered extensively, if not particularly successfully, into the banking field and also from the recent rapid growth of credit unions. Organized labor entered the banking field after the World War, and by 1925 there were 36 labor owned banks with \$98,392,592 on deposit in them and a total surplus and undivided profit of \$3,467,829. By 1935, however, the number was reduced to 4, with a total surplus and undivided profit of \$326,943 and deposits of \$17,262,281.¹⁰

What is said to be the earliest of the employee savings plans is that of the Baltimore and Ohio Railroad, which was established in 1888. Since that time, many plans have appeared, so that the National Industrial Conference Board found, in 1929, that of 319 firms having approximately 1½ million employees, 187 had banking institutions with which they were directly related, 67 had employee savings funds, and 70 had combinations of these features. In 1935, the same agency found that 15.8 per cent (387) of the 2,452 firms surveyed had employee savings plans. Essential features have not changed greatly in these years. The plans are generally administered by a committee upon which both management and workers are represented. Commonly, employees make deposits at each pay period, and such deposits range upward from 25 cents weekly. Ordinarily, interest is paid on monthly balances in excess of \$50. Funds are deposited in outside savings banks or are invested in bonds, except for those that can be loaned to members. Character loans from \$100 to \$200 are the specialty of these plans. They are limited to members, and the rate is ordinarily one cent per dollar per month, or 12 per cent per year. The comparatively high rate of interest, coupled with the fact that administration expenses are often assumed by management, cares for losses.¹¹

¹⁰ "Condition of Labor Banks," *Monthly Labor Review*, February, 1936, Vol. 42, No. 2, pp. 372. See also Spoler, Walter, "Labor Banks in the United States," *American Economic Review*, March, 1936, Vol. 26, No. 1, p. 90ff.

¹¹ See, "Memorandum: Employee Savings Plans," Princeton, Industrial

In some instances, these plans are associated with building and loan associations, which were found in 3.9 per cent of the firms surveyed by the National Industrial Conference Board in 1935. Where the latter exist, they follow the usual procedure for such associations. Members buy stock in the associations, usually on a payment plan, with minimum payments of \$1. Interest is paid on partial payments, so that, on the average, about \$140 is required to purchase one \$200 share. Loans are made only to members and in amounts based on the value of the property by which they are secured. The usual rate of interest is 6 per cent.¹²

Employee bankruptcy. The need for savings and credit facilities for wage earners requires little proof. Studies of bankruptcies among workers indicate that they have doubled in each five-year period since 1920. There were 29,000 such bankruptcies in 1930. Private loaning agencies that can and are willing to make loans to workers are too frequently limited to the personal finance companies and loan sharks. The former frequently charge from 24 to 42 per cent interest, and for the latter no such limits are effective.¹³

Credit unions. Largely because of the absence of adequate small credit facilities, credit unions have grown rapidly in recent years. These associations are said to have begun in Germany in 1848, and the first one in this country was instituted in 1901. Massachusetts enacted the first law specifically providing for their incorporation in 1909, and since that time some thirty-seven other states and the District of Columbia have provided similar legislation. In 1934, Congress enacted a law providing for federal incorporation.

Relations Section, Princeton University, 1929; *Employee Thrift and Investment Plans*, New York, National Industrial Conference Board, 1929; Berman, Edward, "The Massachusetts System of Savings-Bank Life Insurance," Washington, Bureau of Labor Statistics, Bulletin No. 615, 1935.

¹² See, Davis, Eleanor, "Use of Building and Loan Associations in Company Programs for Employee Savings and Investment," Princeton, Industrial Relations Section, Princeton University, 1932.

¹³ See, Nugent, Rolf, "Why Wage Earners Go Bankrupt," *American Bankers Association Journal*, July, 1931, Vol. 24, No. 1, p. 9ff.

The growth of these associations is striking. In 1925, there were 86 associations with gross assets of \$8,500,000. By October, 1936, there were 1,600 federal charters in existence, and the total number of credit unions was approximately 5000 at that time. New associations were being formed at a rate of 100 per month. The National Industrial Conference Board found that 11.3 per cent of the firms included in its 1935 survey had such facilities.

In many cases, management has encouraged formation of these associations, although they are actually chartered by federal or state governments. State associations are required by law to submit to supervision and periodic examination by the state banking authorities, and similar supervision is provided for federally chartered associations. All loans are restricted to members who must own at least one share of stock, generally sold at five dollars, and which may be purchased on an installment arrangement. Officers are elected by members and generally consist of a president, vice president, treasurer, and clerk. Funds are held in an outside bank, and character loans, generally limited to a maximum of two hundred dollars, are the specialty of such associations. Dividends are limited to 6 per cent, and all earnings in excess of that amount are credited to surplus. The experience of the unions has been surprisingly successful.¹⁴

Pensions. Pension provisions have undergone extensive change since 1935, when the federal Social Security Act was passed. Prior to that time, a large number of firms had some sort of retirement allowance. Specific provisions were variously described as "superannuation provisions," "service retirement allowances," "service apportionments," and "old-age pensions." In most cases, these allowances were gratuities, granted to workers by management. They were not annuities in the ordinary sense, in that the latter represent payments made from a fund built up by contributions

¹⁴See, Bergengren, R. F., *The Credit Union: a Cooperative Banking Bank*. Boston: Credit Union National Extension Bureau, 1931.

from the person who later seeks to receive the annuity.

Most industrial pension plans began rather simply with a managerial decision to retire workers at a specified age on a stated proportion of their regular pay. As responsibilities under such simple provisions became more apparent, many firms added requirements as to length of service, or they effected a similar result by specifying age limits for admission to the plan. At the same time, it became increasingly apparent that pension loads might become an impossible burden if careful allowance were not made for the changing age distribution of employees, and many firms felt that it was safer and generally more satisfactory to employ independent insurance companies to provide these pensions.

The extent of private pensions was suggested by a broad study undertaken by Industrial Relations Counselors, Inc. In that survey, concluded in 1928, it was discovered that 100,000 pensioners were receiving an estimated 50 million dollars annually from some 500 systems. The most important single source of pensions was the railroads. They paid out 22½ million dollars in pensions in 1926. The earlier National Industrial Conference Board study of 1925 discovered 248 private pension plans covering 2,815,512 employees. In 1935, the same organization found that 253 or 10.8 per cent of the firms included in its survey of service functions had formal pension plans, which provided coverage for approximately two million employees.

Industrial pensions are of two distinct types. In the older of these, the non-contributory plans, such allowances were provided entirely by management. Recently, the unmistakable tendency has been toward contributory plans, in which employees add their contributions to the funds provided by employers. Membership in pension plans has generally been voluntary, although, in non-contributory plans, it was customary to include all employees not prevented from participation by eligibility requirements. Eligibility generally stresses age at the time of employment, age at retirement, and length of service, with exceptions for

retirement occasioned by disability, and it may restrict coverage to certain types of occupations. Many of the older plans placed particular emphasis on the necessity of continuity of service, for which reason they were bitterly attacked by union leaders as devices by which management sought to break or prevent strikes.

Amounts of pensions are generally based on length of service and wage or salary at the time of retirement, although some plans provide variable benefits scaled according to the number of dependents. A fairly typical pension would be an annual payment in an amount equal to 1 or 1½ per cent of average annual earnings in the most recent five years multiplied by the number of years of service.

Pensions may be administered by management alone, although many firms have found a joint board more satisfactory.

Because of the manner in which industrial pension plans have developed, it is exceedingly difficult to analyze their accounting. Often, pensions were regarded as gratuities to employees and were paid out of current funds rather than from any isolated pension account. Moreover, costs naturally vary with the ages and sex of employees and with accident and health conditions in the industry. In many cases, plans have not given sufficient attention to accrued responsibility as workers become older, taking no adequate account of the fact that future responsibilities are likely to become constantly greater until a peak load is reached. Many studies have disclosed such unsound accounting in pension funds. In one of them, 221 plans were analyzed. Only 85 had funded their pension obligations. Of the 136 which did not do so, 85 charged pensions to operating expenses, 15 charged them to current expenses, 10 made appropriations as the latter were required, and the others secured funds from a variety of non-pension sources. Thirty-six plans had adopted an actuarial basis of computing obligations, while 185 plans had not done so. Only 24 of the plans analyzed were funded and established upon an actuarial

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basis.¹⁵ From such studies, it appears that pensions cost from 1 to 2 per cent of total payrolls, but this figure is almost certainly far too small, for total pension costs can not be adequately determined because of careless accounting.

If pensions are to be provided by industry at all, they should be properly financed, and such a basis requires detailed actuarial analysis of the risk involved. Contributions, whether joint or from employers only, should be sufficient to provide a fund which, invested and assumed to draw interest at a conservative rate, will provide pension allowances as the latter are required. Such an arrangement places pensions on a "reserve" as distinguished from a "cash" or "pay-as-you-go" basis, and that basis alone is satisfactory from the standpoint of the individual concern. European systems, both public and private, have found this basis essential.¹⁶

In estimating the pension burden, it is necessary to take into account a variety of factors, including probable number of pensioners in each future year, the size of pensions to be paid, the number of contributors, and amounts of contributions. These essential considerations can be evaluated only by reference to present age and sex distributions of employees, conditions of eligibility, factors determining size of pensions, labor turnover or continuance rates, disability provisions and benefits, and possible earnings of pension funds.

The recent study undertaken by Industrial Relations

¹⁵ See, Belcher, Donald R., "Industrial Pension Plans, History and Object," *American Accountant*, January, 1932, Vol. 17, No. 1, pp. 11-15; Clinton, L. E., "Contributory Pension Schemes," *Accountant*, August 2, 1930, Vol. 83, No. 2904, pp. 177-180; Kimball, Ingalls, "Accruing Pensions as a Part of Current Operating Cost," *Journal of Accountancy*, September, 1929, Vol. 48, No. 3, pp. 187-190.

¹⁶ See, Kimball, Ingalls, "Industrial Pensions," *Annals of the American Academy of Political and Social Science*, May, 1932, Vol. 161, pp. 33-39; "Memorandum: Rules and Financial Provisions of Industrial Pension Plans," Princeton, Industrial Relations Section, Princeton University, 1928; Dick, W. A., "The Westinghouse Electric Annuity Plan," *Personnel*, May, 1930, Vol. 7, No. 1, pp. 3-9; Stewart, Bryce M., "Financial Aspects of Industrial Pensions," American Management Association, General Management Series, No. 87, 1928.

Counselors, Inc.,¹⁷ indicates clearly the tendency for the number of pensioners and amounts of pensions to increase rapidly in early years of pension plans. The number of pensioners was found to have increased at a rate of 11.5 per cent per annum, while amounts paid out in pensions increased at a rate of 13.8 per cent per year. The study also indicates the clear-cut tendency toward replacement of non-contributory systems by contributory systems and the growing practice of reinsuring risks with outside insurance organizations.

The whole question as to whether industrial pensions are worth while is now receiving additional consideration, since the federal government now provides an inclusive system of old-age benefits, and since a compulsory system of retirement allowances for railroad workers became effective in 1936. It is recognized, of course, that the population of this country is undergoing a change in age distribution that will place a much larger proportion of its total in the older age groups. As is indicated in Table XXVII, it is estimated that the proportion over 65 will be more than twice as great in the year 2000 as at present. English experience indicates

TABLE XXVII
ACTUAL AND ESTIMATED NUMBERS AND PROPORTIONS OF THE POPULATION
OVER 65 YEARS OF AGE IN SPECIFIED YEARS.¹⁸

Year	Number in Millions	Percentage	Year	Number in Millions	Percentage
1860	.85	2.7	1940	8.31	6.3
1870	1.15	3.0	1950	10.86	7.7
1880	1.72	3.4	1960	13.59	9.3
1890	2.42	3.9	1970	15.07	10.1
1900	3.09	4.1	1980	17.00	11.3
1910	3.98	4.3	1990	19.10	12.6
1920	4.94	4.7	2000	19.34	12.7
1930	6.63	5.4			

¹⁷ *Industrial Pension Systems in the United States and Canada*, New York, 1936.

¹⁸ Adapted from the report of the President's Committee on Economic Security.

that approximately 63 per cent of those over 65 may be expected to be eligible for pensions, since that proportion was receiving such assistance in 1931.¹⁹

Extensive provisions for public, compulsory pensions have recently been made. A law providing retirement benefits for railroad workers was enacted in 1934, but the Supreme Court held it unconstitutional in May, 1935. Two additional acts were passed in August, 1935, to replace the voided legislation, and benefit payments under their provisions began on July 13, 1936, in spite of the fact that lower courts had indicated serious question as to the constitutionality of the substitute legislation. To avoid further disputes, however, the President suggested that employers and employees combine to plan an act to take the place of the controversial legislation. As a result, the Railroad Retirement Act of 1937 and its accompanying taxing measure, the Carriers' Taxing Act of 1937, were approved in June, 1937. The new acts provide coverage for all employees of express, sleeping car, and railroad companies subject to the Interstate Commerce Act.²⁰

In 1936, also, the collection of taxes under the old-age benefit provisions of the Social Security Act of 1935 was initiated. Benefit payments are to begin, under the Act, January 1, 1942. In the meantime, old-age *assistance* provisions of the same act have encouraged many states to expand earlier provisions for assistance of the aged needy. The federal act provides for a long-time program of "benefits" or pensions to be administered directly by the federal government. Funds are being accumulated from taxes levied in equal amounts on employers and employees, and pensions will be paid, beginning in 1942, in amounts proportional to these taxes, which are based on the employee's earnings. At the same time, the federal act provides funds for old-age assistance, such funds to be used in matching

¹⁹ *Monthly Labor Review*, October, 1935, Vol. 41, No. 4, p. 929.

²⁰ Specific provisions are summarized in the *Monthly Labor Review*, August, 1937, Vol. 45, No. 2, pp. 377-379.

state appropriations for this purpose and to be administered through approved state agencies. It is planned that old-age assistance shall be available for those who cannot meet the requirements for pensions and shall be distributed upon the basis of need. The long-time benefit or pension plan provides monthly benefits without reference to need.

The federal tax for old-age benefits was held constitutional on May 24, 1937.²¹

Many private pension plans have been discontinued or greatly reduced in coverage since these legislative enactments have gone into effect. The so-called Clark amendment to the Social Security Act would have exempted from the compulsory features of the Act employees included in private pension plans that met certain standards. Sponsors of the Act felt, however, that it would be difficult if not impossible to establish and administer suitable standards for private plans, and no such exemption is now permitted. As a result, the new legislation has removed the need for many private plans. Earlier state pension programs, operating in thirty-two states and three territories in 1935, had not generally conflicted with private provisions. Most of them had made aid available only on the basis of actual need and were not mandatory or state-wide in coverage. In other words, they permitted but did not require counties within the states to provide pensions. Because of these provisions, public pensions were often available in only a few industrial counties of the states.

The program initiated by the federal Social Security Act is obviously quite different. State old-age assistance plans, in effect the former state old-age pensions, must be mandatory and state-wide, under the Act, to receive the benefit of federal subsidies, which amount to 50 per cent of the total grant up to a maximum of \$30 per month in each individual case plus an allowance for administration. The federal long-time benefit or pension plan is compulsory for some

²¹ *Helvering and Edison Electrical Illuminating Co. of Boston v. George P. Davis*, 57 Sup. Ct., 904.

thirty-two million employees (excluded occupations are the same as those noted in connection with the unemployment provisions on page 464), without respect to the size of the establishment in which they may be employed, and it is proposed to provide pensions for all those who arrive at pensionable age, without respect to need. Moreover, the taxes levied under the Act for these purposes, which reach a maximum of 3 per cent each from employer and employee on the first \$3000 of annual earnings, have largely absorbed the amounts employers might have allocated to private pension funds.

On the other hand, many firms have preferred to continue their pension provisions, especially if the latter are voluntary or noncontributory, either because they feel that employees will need the additional income so provided in old age or because they believe that the Social Security Act or its pension provisions may at some later date be invalidated by the courts. In still other cases, plans are being continued because certain employees cannot qualify for the federal pensions in any adequate amount on account of their present advanced age.

There is ample room for private pensions within the framework provided by the Social Security Act. The Act provides only for a pension throughout the retired worker's lifetime, coupled with a possible death benefit. There is no provision for continuing benefits to dependents and no means by which the retired worker can have his pension reduced, thus providing payments for his dependents, although such options are provided by the Railroad Retirement Act, and railroad workers have taken extensive advantage of them. Further, the Social Security Act was planned to care particularly for lower-paid workers and for those already well along in years, at the expense of higher paid and younger workers. Under the circumstances, many managements are finding supplementary retirement plans well worth while. These supplementary plans provide employees with additional pensions at the same time that

they facilitate quite different types of pension payments, including survivor forms of annuity. The option most commonly sought is one which provides for reduced pensions with unpaid balances credited to a workman at his death payable thereafter for the life-time of his wife.

By and large, it is probable that the future may see a continuing decline in the provision of private industrial pensions if the present public provisions remain in force. Private provisions will become less necessary as employees who are now in younger age groups become eligible for public pensions. Many of the private plans have been inadequately financed and should welcome an opportunity to dissolve without more serious repercussions. Organized labor consistently opposes private plans, so that, if organization continues to expand, fewer workers may be expected to avail themselves of voluntary, contributory arrangements.

To the extent, however, that private plans are continued, effective personnel management may be expected to reduce the costs of these plans. Careful attention to accidents and to conditions affecting workers' health tends to reduce disability allowances, while the same conditions encourage continued employment beyond ages at which employees could, if they wished, retire on allowances.²²

Insurance. Many types of insurance have been provided by various managements for their employees, but the most common are those providing payments for non compensable accidents, non compensable illnesses, and death. In addition, some firms have provided coverage for maternity, unemployment, and other contingencies.

Such risks may, of course, be met in other ways. Mutual benefit associations frequently provide coverage for them. In several European countries, public health insurance is available for this purpose, and it is possible that this country

²² See, Clark, J. C., *The Relationship between a Personnel Program and Pension Costs*, American Management Association, Personnel Series, No. 8, 1930.

may have similar provisions as a result of the beginnings made in the Social Security Act. Trade union benefits are available to the members of certain labor organizations. Private health and life insurance may be purchased by workers. As has been indicated, however, private insurance does not meet labor's needs perfectly, particularly because of its failure to make allowance for periods of unemployment in which policies are ordinarily allowed to lapse, and because of its expense.

Group life insurance has been management's most common answer to the need. In 1931, it was estimated that 6 million employees were protected by such policies, with the average policy providing approximately \$500 in benefits. The National Industrial Conference Board study of 1935 found that 58.7 per cent of the 2,452 firms involved provided life insurance, while 30.7 per cent also provided health and accident insurance. There appears to be little difference in such provisions among companies of varying size, but public utilities, financial institutions, manufacturers of paper and metal products, and chemical industries displayed the greatest interest in such provisions. These insurance provisions have met with tremendous approval, because individual workers have for the most part not previously provided themselves with this coverage; less than 40 per cent of the industrial workers of the nation are estimated to have private life policies, and most of them are of less than \$500 face value. Moreover, private policies for industrial workers are expensive, more expensive than non-industrial insurance.

The group insurance idea for industrial workers first attracted public attention in 1912. In part, it appears to have reflected favorable results of the Massachusetts system of Savings Bank Life Insurance, instituted by law in 1907. By 1927, some 5 million employees were protected by 5½ billion dollars worth of such insurance, and premium costs amounted to 60 million dollars. This cost represented from ½ to 1½ per cent of total payrolls in the firms providing such

insurance. When the plans were instituted, costs were generally charged to the employees who benefited from these plans, but since the early 1920's, the tendency has turned toward increasing subsidization by employers.

Provisions of group insurance plans are fairly uniform. It is typically term or renewable term insurance. Ordinarily, only employees having been on the payroll a specified period of time are eligible for participation, and the length of service requirement varies from three months to one year. Sometimes, minimum and maximum wages or salaries are specified, and workers outside this range are not allowed to participate. Some firms require participation by all eligible employees; others make participation entirely optional. Most common practice provides a standard value policy of \$500 to \$1000, but it is not uncommon to find that employees may, if they wish, increase this amount at their own expense. Obviously, such provisions are possible only where employees contribute to the cost of the insurance, and there is a wide range of practice in that connection. Sometimes workers pay nothing for the insurance; sometimes they pay the entire cost; and sometimes there is a sharing of this burden by management and employees.

Some plans include disability provisions as well as death benefits. Generally, there is a stipulation, especially in contributory plans, that permits workers who leave the firm to convert group policies into other standard forms without medical examination.²³

The need for service functions. Needs for various types of services change constantly. What may be needed at one time may be provided by governmental action at another, as has been indicated in the field of industrial pensions. It should never be assumed that any sort of service is necessary simply because it is not provided, and careful investigation must precede every development of any type of service. Possible public provisions should be carefully evaluated, as

²³ See, *Industrial Group Insurance*. New York: National Industrial Conference Board, 1927.

should possible coöperative employee action. Credit unions in which most of the initiative is provided by employees may, for instance, prove considerably more satisfactory than savings plans instituted by management. On the whole, fewer services are necessary now than were required a few years ago.

Employee attitudes represent a highly important condition influencing the effectiveness of every type of service. None can be highly satisfactory unless employees want it and are willing to support and use it. For this reason, it is desirable to canvass both the need for existing or contemplated provisions and the prevailing attitudes toward such services.

Statistical evaluation. One simple sampling technique may be found quite useful in determining the need for such services. The *standard error of mean* is used to determine how extensive a sample may be necessary to insure fair representation of prevailing conditions. Its use for this purpose may be illustrated by reference to a type of problem that arises frequently. It may be assumed that management wishes to estimate the present life insurance protection of its employees. It prefers not to send out a questionnaire or to interview all its 3000 employees, because of the known prejudice against managements that appear to be prying into personal affairs of workers. There is available, however, from the personal records of some 50 additions to the working force in recent years, information that indicates the average policy carried by such workers to be \$200. Management feels that these workers are a random sample of the whole group, but it would like to be sure that its estimate does not vary by more than \$10 from the actual average for all employees, and it desires to know whether this sample mean may be assumed to be that accurate or, if not, how many additional workers must be investigated to insure that the average so discovered meets these qualifications.

The answer to this typical question is found by manipulating the standard error of this mean. The standard devia-

tion of the sample group (σ_s) is first calculated, and the standard error of the mean is then measured as

$$\sigma_M = \frac{\sigma_s}{\sqrt{n-1}}$$

In this case, the standard deviation is found to be 42.63, and the standard error of the mean is

$$\sigma_M = \frac{42.63}{\sqrt{50-1}} = \frac{42.63}{7} = 6.09$$

It is desired, however, to secure such an estimate of the average by sampling that the actual average will not vary from this estimate by more than \$10. Since three standard errors are regarded as indicating practical certainty, then what is necessary is that the sample be sufficiently large so that three standard errors of the mean shall not exceed 10, that is, that one standard error shall not exceed $\frac{10}{3} = 3.33$. Obviously, the present sample is too small since the present standard error is approximately twice this size. All that is necessary, however, is to substitute the desired standard error in the usual formula and solve it for a new n , which may be designated n' , thus

$$3.33 = \frac{42.63}{\sqrt{n'-1}}$$

This equation may then be solved,

$$3.33 \sqrt{n'-1} = 42.63$$

$$\sqrt{n'-1} = 12.802$$

$$n' - 1 = 163.89, \text{ or } 164$$

$$n' = 165$$

It appears, therefore, that a total sample of 165 employees must be taken to bring the sample mean within desired range of reliability. The convenience of this technique and its advantage over broadcast questionnaires will be evident.

Exercises and Problems

1. Prepare a report on one of the articles mentioned in footnotes.

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$$3.33 = \frac{42.63}{\sqrt{n'} - 1}$$

This equation may then be solved,

$$3.33 \sqrt{n'} - 1 = 42.63$$

$$\sqrt{n'} - 1 = 12.802$$

$$n' - 1 = 163.89, \text{ or } 164$$

$$n' = 165$$

It appears, therefore, that a total sample of 165 employees must be taken to bring the sample mean within desired range of reliability. The convenience of this technique and its advantage over broadcast questionnaires will be evident.

Exercises and Problems

1. Prepare a report on one of the articles mentioned in footnotes.

2. Distinguish mutual benefit associations, employee savings plans, trade union benefits, credit unions, group insurance.

3. Prepare a report to be submitted to the general manager of an industrial plant on factors to be taken into account and information required as a basis for (1) a private pension plan, (2) a group life insurance plan.

4. A firm wishes to discover how its employees might probably regard a savings association. It seeks to learn how much its employees have in savings accounts. A survey of 101 random cases indicates average savings of \$240, with a standard deviation of \$48. How many additional workers must be queried in order to be sure that the average thus secured is within \$10 of the actual average?

5. Management has been sampling rents among its employees as a basis for a possible housing program. It finds, by interviewing a sample of ten workers, that average rents are \$21.50 and the standard deviation is \$1.50. It is desired that the sample average shall not vary from the actual average by more than \$1. Is the sample adequate? If not, how many additional cases must be included?

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CHAPTER XXIII

Personnel Administration in the Public Service

NO discussion of modern personnel administration could be complete which did not give some attention to personnel policies and practices in the public service. That field has grown greatly in recent years, and no insignificant portion of the gainfully employed is now subject to the personnel policies of governmental agencies. Moreover, with the coming continued expansion of activities related to the comprehensive social security program, there is every reason to expect many aspects of public service to grow still further.

No entirely accurate count of those employed by governmental agencies is available, nor would such a detailed census be particularly valuable, since the number is subject to constant change. Growth in these services may, however, be illustrated by reference to approximate numbers. In the federal service, for instance, it may be said that there were some 1000 employees in 1800, 20,000 in 1830, 100,000 in 1883, 446,000 in 1930, 572,000 in early 1933, and 824,000 on June 30, 1936. Labor turnover among these employees requires the selection of some 60,000 new appointees annually.

State and local services have also expanded greatly as increasing functions have been assigned to these branches of government. At present there are more than one million municipal employees in the nation; and state, county, and city governments together employ more than two million. The total of public employees is approximately 3,300,000, not including workers on federal relief projects.

As will be noted, a large portion of the total number em-

ployed by the federal government is represented by recent additions made since the advent of the Roosevelt administration in 1933. Some 50 new agencies were created between 1933 and 1936, of which 38 were still functioning in 1937. The net increase in federal personnel in this period was approximately 252,000.

Administrative agencies. It will be clear that the personnel policies affecting these public employees are quite varied, since they reflect numerous employing agencies. Federal, state, county, and city services vary greatly as to policies as do the individual governmental bureaus and departments within these major divisions. Personnel policies in the public schools, for instance, may differ almost completely from those in force in fire or police departments, and both may be quite different from those in effect in a state or federal bureau.

Administrative agencies charged with responsibility for personnel problems are of many types. Within the federal government, the most important is now the Civil Service Commission, although it can in no sense be charged with responsibility for all personnel policies, since many of them are determined largely by the various departments, commissions, bureaus, divisions, and sections into which the government is divided. In fourteen states, civil service boards or commissions have been established,¹ as they have been, also, in some 325 cities and smaller governmental divisions. Almost all cities of 125,000 or more population have such agencies. Even where there are such commissions, they

¹ The fourteen states having civil service provisions in 1937 were (dates indicate year of enactment): New York, 1883; Massachusetts, 1884; Illinois, 1905; Wisconsin and Colorado, 1907; New Jersey, 1908; California and Ohio, 1913; Kansas, 1915; Maryland, 1920; Arkansas, Connecticut, Maine, and Tennessee, 1937. The Kansas law is ineffective because no funds are available for its administration. Connecticut passed a law in 1913 and repealed it in 1921.

Michigan's new law is fairly typical of those recently enacted. It requires efficiency ratings, job classification, selection by competitive examination, and six months' probationary period for new employees. The law also regulates hours of work, vacations, transfers, promotions, demotions, and suspensions.

represent only the more formal aspects of personnel procedure, for much of the policy determination is left to individual bureaus and sub-divisions.

Attention cannot be given to the detailed administrative provisions of individual localities, but the most common features of the major civil service divisions may be noted. The federal civil service is administered by a Civil Service Commission of three members appointed by the President and confirmed by the Senate. Appointments are for unlimited terms, and members devote their full time to these appointments. The Commission is regarded as non-partisan.

State administrative agencies are variously described as civil service commissions, personnel boards, and efficiency boards. Members are usually appointed by the governor with legislative confirmation. In some cases, board members are paid on a salary basis and are expected to devote full time to their duties. In other cases, the board is unpaid, following the practice established in connection with school boards, and is allowed a per diem compensation for time expended in the work. Some local boards are described as bi-partisan, while others are intended to be beyond all political relationships.

Historical development. Personnel policies in the public service have undergone great changes as the number of agencies and activities has expanded and the nation has grown. Developments in individual states and cities have roughly paralleled those which have featured the federal government, and it may be sufficient, as a means of providing perspective, to direct attention to the steps by which the present federal service has emerged.

The background of most governmental personnel programs is strongly colored with patronage. It has been said that the ancient Greeks selected governmental officials by lotteries, much as juries are now drawn, but early in the middle ages, the practice of buying public office became firmly established. In some cases, incumbents not only

purchased the office but also the hereditary rights to it, and it was largely as an objection to this aspect of the practice, as it was permitted to develop under George III of England, that American colonies, when they declared their independence and adopted individual constitutions, specified short, limited terms of office. The constitution of the State of Massachusetts, for instance, specified a maximum period in public office of four years.

In this country, the requirement of such short terms of office-holding, coupled with the ideals of self-government so vigorously upheld in the early years of the nation, encouraged wholesale turnover in governmental positions and facilitated the early dependence upon the spoils system, which was frankly advocated by many of the nation's outstanding leaders. Andrew Jackson did little more than to follow fairly well-established precedent in his open exposition of the spoils system, and he definitely voiced much prevailing sentiment in his assertion that long tenure was likely to result in undesirable bureaucracy and graft.

As the work of the government became more extensive, however, it was apparent that widespread shifting of personnel resulted in much lost time and inefficiency, and there was general agreement that clerical positions should not be subject to the spoils system. Accordingly, in 1853 and 1855, a series of acts established an examining board for clerks and provided for their classification and the standardization of salaries among clerical positions. For thirty years that was the only federal legislation on the subject, and states took no action in that direction in this period. Then, in 1883, the Civil Service Reform Act (sometimes referred to as the Pendleton Act) provided for a much more extensive classification of federal employees, and in the same year the first of the state civil service laws (that of New York) was enacted.

Federal legislation has been repeatedly supplemented since that time to bring increasing proportions of all federal employees into the classified service. Beginning in 1902,

a series of reports stressed the need for such an extension of the classified service. Best known of these was the report of the Keep Committee, appointed by President Theodore Roosevelt in 1905, which was submitted in final form in 1907. The committee, officially designated as the "Committee on Department Methods," in its report stressed the need for further classification. Later, President Taft appointed a Committee on Economy and Efficiency in 1910, and in 1919 the investigation made by the Congressional Joint Committee on Reclassification of Salaries led to the Classification Act of 1923. That Act established a Personnel Classification Board, consisting of the Director of the Budget, who was to be chairman, a member of the Civil Service Commission, and the Chief of the Bureau of Efficiency. The new Board was instructed to create uniform classification schedules and to determine salaries for each classification.

The Board allocated approximately 50,000 positions in the following year, and it approved the semi-annual ratings established by the Bureau of Efficiency. Its duties were further extended by the Rogers Act of 1924, which included foreign service positions in the classified service; by the act of 1925, which brought the postal field service into the same category; and by the Welsh Act of 1928, by which the Board was ordered to classify the field or foreign commercial services of the government. Its authority was definitely established, as far as the allocation of salaries is concerned, by the Brookhart Act of 1930. This act also gave the Board a definite appropriation for its personnel. Until that time, the Board had operated entirely with personnel loaned to it from other departments.

The most recent act affecting the administrative machinery of the federal civil service is Title 5 of the Economy Act of 1932. That law abolished the Personnel Classification Board and transferred its duties, as a whole, to the Civil Service Commission. The latter agency is, therefore, now charged with the major administrative responsibility in the federal service. Its policies are effective, in greater or lesser

degree, in practically all federal agencies, although its classification is formally applicable only to the departmental services, regular executive departments, the Library of Congress, the office of the Capitol Architect, the botanical gardens, and the municipal government of the District of Columbia. These agencies now employ some 500,000 persons and require forty to fifty thousand appointments per year. The field services of the government are still controlled, as far as classification is concerned, by the heads of departments involved. Strictly emergency agencies established during the recovery period are also outside the classified service.

Job analysis and classification. The general nature of activities involved in job analysis and classification can best be illustrated by reference to the federal service, although several states have set up similar systems. The chief continuing activity of the former Personnel Classification Board was the analysis of civilian positions in the government service and their classification, and the Civil Service Commission is placing equal emphasis upon this function. Both old and new positions are analyzed and classified. The federal service, as has been noted in Chapter V, is now divided into five major divisions, including (1) professional and scientific (symbol P), (2) subprofessional (SP), (3) clerical, administrative, and fiscal (CAF), (4) custodial (Cu), and (5) clerical-mechanical (CM). The manner in which employees are divided among these classifications is suggested by their definitions:

PROFESSIONAL AND SCIENTIFIC

Those whose duties and responsibilities are based on the established principles of a profession or science and which require incumbents who have had scientific or professional training equivalent to graduation from a college or university of recognized standing; for example, attorney and economist.

SUBPROFESSIONAL

Those which are subsidiary to the professional; for example, laboratory aide and hospital attendant.

CLERICAL, ADMINISTRATIVE AND FISCAL

Those whose duties and responsibilities are of a clerical, administrative or fiscal nature; for example, typist, administrative officer, and book-keeper.

CUSTODIAL

Those whose duties are of a custodial nature; for example, elevator operator, laborer, and guard.

CLERICAL-MECHANICAL

Those which are not in a recognized trade or craft and which are located in the Government Printing Office, the Bureau of Engraving and Printing, the Mail equipment shop, the duties of which are to perform or direct manual or machine operations requiring special skill, and to verify the product of manual or machine operations.

The services are further divided into "grades." A grade is regarded as "one or more classes of positions for which approximately the same level of qualifications and compensation is prescribed." Grades are distinguished by the relative "importance, difficulty, responsibility, and values" of the work, and each of the services has a number of grades. There are nine in the professional service, the clerical, administrative and fiscal has sixteen, the custodial ten, the subprofessional eight, and the clerical-mechanical four.

Within the grades, there are classes. Classes represent the smallest subdivisions of the classification system, and each class includes a group of positions sufficiently similar in duties and responsibilities so that similar educational and experiential requirements are appropriate, as are similar selective criteria, and similar rates of compensation. Thus a position may be designated as in the clerical, administrative and fiscal services, grade 2, and junior stenographer class.

The method in which these divisions are combined to provide the complete classified system is suggested by Table XXVIII, which outlines rates of payment for various grades in the several services. Classes can not be identified, but the grades provide measures of the ranges within which such classes must fall.²

² See, Stuart-Banning, G. H., "Classifying the United States Civil Service,"

TABLE XXVIII

UNITED STATES CIVIL SERVICE COMMISSION CLASSIFICATION PAY SCALES

Grade	Service				Class							
	P	CAF	CU	SP	\$ 600	\$ 600	\$ 660	\$ 720	\$ 780	\$ 840	\$ 840	
1	1		1	1	\$ 600	\$ 600	\$ 660	\$ 720	\$ 780	\$ 840	\$ 840	
			2 ^a	1	1020	1080	1140	1200	1260	1320	1380	
			3	1	1080	1140	1200	1260	1320	1380	1380	
			2	1	1200	1260	1320	1380	1440	1500	1500	
	2		4	2	1260	1320	1380	1440	1500	1560	1620	
			3	2	1320	1380	1440	1500	1560	1620	1680	
	3		5	3	1440	1500	1560	1620	1680	1740	1800	
			4	3	1500	1560	1620	1680	1740	1800	1860	
	4		6	4	1620	1680	1740	1800	1860	1920	1980	
			5	4	1680	1740	1800	1860	1920	1980	2040	
	5		7	5	1800	1860	1920	1980	2040	2100	2160	
			6	5	1860	1920	1980	2040	2100	2200	2300	
	6		8	6	2000	2100	2200	2300	2400	2500	2600	
			7	6	2300	2400	2500	2600	2700	2800	2900	
	7		9	7	2600	2700	2800	2900	3000	3100	3200	
			8	7	2900	3000	3100	3200	3300	3400	3500	
8		10	8	3200	3300	3400	3500	3600	3700	3800		
		9	8	3500	3600	3700	3800	3900	4000	4100		
9		11			3800	4000	4200	4400	4600			
		12			4600	4800	5000	5200	5400			
10		13			5600	5800	6000	6200	6400			
		14				6500	7000	7500				
11		15				8000	8500	9000				
		16										
					In excess of \$9000							

^a 50 cents and 55 cents per hour are specified for charwomen and head charwomen, respectively.

Many of the states have followed the federal example as to job analysis and classification, as have many of the non-civil service federal agencies such as the Farm Credit Administration, Tennessee Valley Authority, and others.

Selection. For positions covered by federal, state and local civil service arrangements, the usual method of selection involves the use of examinations, preceded by broadcast announcements, and open to the public at large. Such ex-

Public Administration, October, 1929, Vol. 7, No. 4, pp. 343-347; *Preliminary Class Specifications of Positions in Field Service*, Washington, Personnel Classification Board, 1930; Baruch, Ismar, "The Administration of a Classification Plan Through Periodic Audits," Chicago, Civil Service Assembly of the United States and Canada, 1936; *Division Organization Manual*, Washington, U. S. Civil Service Commission, September, 1937.

aminations are announced whenever new positions are to be filled or when examined personnel for established positions is no longer available from lists of those who have successfully passed earlier examinations. In some cases, these lists or "registers," as they are usually described, may have a definite term by rule of administrative authorities, or they may be used until all names are exhausted. In the federal civil service, it is intended that registers are to be replaced each year and an attempt is made to allow no register to become more than three years old, for obvious reasons, but exceptions are occasionally made to these rules. Late in 1936, there were 670 federal registers from which appointments to various branches of the federal service could be made.

Examination procedure in the civil service follows well-established rules. Examinations are of two principal types, the "assembled" examinations, which are written and may be held in various localities throughout the nation, and the "unassembled," in which individuals are judged by a special examining board without the competitive written procedure and largely on the basis of education, training, and experience. The latter are used in cases of promotions within the service and for certain positions in which they are required by executive or congressional action, generally where specialists of a particular type are to be secured. In some cases, written examinations are supplemented by oral examinations.³

Eligibility and ratings are seldom based entirely upon performance in the examination. Generally, fairly complicated applications are required as a preliminary to the written or oral examination. Such applications state the candidate's educational and experiential qualifications in detail, and a portion of the rating accorded him is determined by reference to these items. Sometimes, also, an interview

³ See, Dickens, J. W., Evans, L. C., Finer, Herman, and Hill, L., "Examinations for Local Officials: a Symposium," *Public Administration*, July, 1938, Vol. 6, No. 3, pp. 378-317.

supplements these considerations. Generally, each of these features is given certain weights, which facilitate their combination in an over-all rating. The federal government makes use of its Form 8 in taking applications, after which those who appear eligible for examinations are notified and provided with an official admission card. In some cases, further investigation of candidates is undertaken by the Civil Service Commission's division of investigation.

When ratings have been given all successful candidates, the latter are listed on the register in the order of their ratings. Then, when requests or requisitions for needed personnel are received, individuals with highest ratings are certified for these positions. Certification procedure varies widely. In some cases, one more candidate is certified than is required, thus giving the requisitioning officer a very limited choice. In other cases, selection may be made from the entire register, and various modifications of these two extreme procedures are in use.⁴

Training. Little attention has been given, in most governmental services, to the training of new appointees. Almost no formal training has generally been available, and it has been tacitly assumed that new appointees would learn how to perform their duties largely by suggestion from their fellow workers or supervisors. A few exceptions to this general rule have appeared, including especially the training program for amateur and semi-professional public officials in New York State provided by the New York conference of mayors and financed in part by a grant from the Spelman fund. Furthermore, a number of colleges and universities have provided limited training for a few specialized public officials, although such training has seldom been readily available to any large number of new appointees to the public service.⁵

⁴ See, O'Rourke, L. J., "A New Emphasis in Federal Personnel Research and Administration," Washington, Civil Service Commission, 1930.

⁵ See, Hall, Albert H., "Training Schools for Municipal Officials in New York," *National Municipal Review*, October, 1931, Vol. 20, No. 10, pp.

Within the last few years, a definite trend toward more carefully planned training for public service has appeared. It reflects particularly the public response to the report of the Commission of Inquiry on Public Service Personnel, which became available in 1935.⁶ As a result, several prominent universities and colleges have established special curricula intended to prepare students for governmental positions and to assist those already in the public service to improve their qualifications for that service.

Naturally, however, such training is and must be limited largely to the better-paid public positions, and the great mass of public employees remain in need of definite training programs such as many business units have found essential. Some branches of the public service are keenly aware of this need and have taken steps to meet it. The United States Employment Service is notable in this respect. It has cooperated with the services in several states in undertaking fairly comprehensive training programs which have already demonstrated their value. As provisions for the administration of public unemployment insurance and other phases of social security are expanded, the need for similar training will become greater and more apparent.

Rating. Various types of ratings are in general use throughout governmental services. Many states have followed the lead of the federal government in requiring regular semiannual ratings of all or most employees. In many cases, some form of graphic or numerical scale is used, and considerable dependence is placed on ratings as a basis for salary and wage adjustments and promotions, as is indicated by the fact that exceptionally low ratings frequently cause

596-599; Olson, Emory E., "Training Programs for Government Employees," *Personnel Journal*, February, 1937, Vol. 15, No. 8, pp. 283-287.

⁶ *Better Government Personnel*, New York, McGraw-Hill Book Company, Inc., 1935. See also *Minutes of Evidence at Hearings held in Washington, New York, Chicago, Minneapolis, St. Paul, Seattle, San Francisco, Berkeley, Palo Alto, Los Angeles and Richmond, 1934*, New York, McGraw-Hill Book Company, Inc., 1935; and the several monographs resulting from the Commission's work and listed in the bibliography at the end of this chapter.

automatic demotion. The federal government has placed major dependence, in the past, on the scale illustrated in Figure 23, pages 256-257.

The rating forms and procedures in use in the public service, for the most part, reflect practically all the defects noted in Chapter XII. A few individual agencies have greatly improved upon these established rating procedures, while a number of the smaller governmental units now make use of the Probst public service ratings for police, firemen, and other employees. Some of the rating scales and programs developed by the United States Employment Service, the Farm Credit Administration, and other federal agencies represent valuable contributions resulting from a great amount of careful, critical investigation of the problem of public service rating and are an unquestioned improvement over many of the simple scales in general use.

Compensation. It is rather generally believed that compensation for public employees is somewhat below that prevailing in private employment. To some extent, this deficiency is counterbalanced by additional security in employment, that is, avoidance of seasonal and cyclical reductions in employment. Actually, it must be admitted that some public positions are overpaid, while others are clearly underpaid. There is a widespread tendency to avoid a careful adjustment of compensation to the value of duties performed.

The range of salaries in the federal classified services is indicated in Table XXVIII, where it will be noted that annual salaries range from \$600 to approximately \$10,000. Few state services provide an equal range. Generally, except for salaries in state universities, upper limits in the state services are about half that which characterizes the federal service.

Within the federal service and in many of the state services, salaries are supposed to be adjusted to levels prevailing for similar positions outside the public service. The Personnel Classification Board was instructed to effect such

adjustments by the act which created it. In practice, however, state and federal services tend to lag behind outside employments in both of the principal phases of the business cycle. The lag became so pronounced in the federal service during the World War that it was necessary to provide bonuses for office holders in order to make up for the discrepancy between earnings and rising living costs.

Little attempt is made to scale individual earnings according to performance, that is, to provide any sort of incentive wages. For the most part, no measure of performance is maintained, so that incentives based upon such a measure are not possible.

Promotion and transfer. Systematic promotions, like incentive wages, are almost unknown in the vast majority of public positions, in spite of the frequent references to a "career" service. Within the federal service, provision is made for promotion as a result of examinations, and regular increases in salary are provided for those whose service continues and whose ratings are satisfactory. Many state services make some provision for automatic salary increases but few of them involve anything approaching systematic promotions.

Transfers within the public service are equally uncommon. While they have always been theoretically possible in the federal service, it is only recently and through the informal Council of Personnel Administration (made up of personnel officers in various departments) that they have been facilitated. Within state services, they are much less common, and employees who find themselves unfitted for the positions they hold can do little except to leave the service and attempt to enter again in departments which appear likely to be more satisfactory.

Recently, recognition of the ill effects of this situation has encouraged a widespread demand for more intelligent policies with respect to both promotion and transfer. Within the federal service, a definite program to develop "career" aspects throughout various divisions and departments has

appeared, especially in those positions in which college graduates can be interested.⁷ State and local divisions are, to a lesser extent, cooperating in similar developments, as is indicated by their participation in in-service training programs.

Interest and discipline. Few of the techniques described in an earlier chapter as means of awakening and maintaining interest among employees or as devices for disciplining them have been used in the public service. Some of the more recently developed branches, including the Employment Service and its Occupational Research Program, have taken steps along the lines defined by business practice, but most public agencies have almost entirely neglected this aspect of modern personnel procedure.

Greatest dependence has been placed, as far as discipline is concerned, upon ratings and their use in determining promotions and demotions. In certain branches of the service, notably postal and treasury divisions, a system of continuous investigation and spying is utilized to discover employees who are dishonest, and this constant secret checking has something of a disciplinary effect. Generally, also, there is an attempt to enforce the rule that public employees in other than educational institutions shall not take an active or leading part in political campaigns. There are, however, few, if any, suggestion systems, formal provisions for investigating grievances, or planned programs to interpret the work and quicken interest in its efficient performance.

Collective bargaining. Organization of public employees is universally permitted, but some jurisdictions give it much greater encouragement than others. Within the federal service, organization is general, and large unions represent employees in each of several major divisions of the service. A similar arrangement has become increasingly common in

⁷ See, Lubin, Isador, "Government Employment as a Professional Career in Economics," *American Economic Review*, March, 1937, Vol. 27, No. 1, pp. 216-224; White, Leonard D., "New Opportunities for Economists and Statisticians in Federal Employment," *ibid.*, pp. 210-215.

most of the state services in recent years. While governmental agencies seldom effect a formal collective agreement with such organizations, the latter provide effective lobbying agencies and their activities in dealing with legislatures are in many respects similar to those of outside unions in their dealings with employers.

Service functions. Mutual benefit associations and credit unions are common among public employees. Even more common are retirement provisions, and a large portion of all public employees are included in pension plans. Disability provisions are much less common, and the other service features noted as featuring private industry and business are almost entirely absent. A few agencies have undertaken to encourage recreational programs, and there are isolated instances where housing, dining facilities, and other such services have been provided.⁸

Limitations. Many obvious limitations of the personnel policies characteristic of the public service have been suggested in preceding paragraphs. A few of the most common and serious of them deserve special attention, however, since they seriously handicap the efficiency of the whole service.

The selective program in most cases places too great emphasis upon experience. In an effort to avoid the necessity of training new appointees, many units have so stressed experience as a requirement for all positions that likely material is effectively prevented from entering the government service. Until recently, there were no federal positions for which college graduates without business experience were available. As a result, many such persons who were genuinely interested in public service were forced to go into non-governmental positions in order to secure prerequisite experience. Once in business, many of them could not afford to make the transfer to public service.

Similar objection can be made to methods of recruitment.

⁸ See, "Public Service Retirement System," *Monthly Labor Review*, August, 1930, Vol. 31, No. 2, pp. 72-80.

Ordinarily, notices of impending examinations are posted in local post offices, and some mention of them may be made in local newspapers. It is significant, however, that private business finds it necessary to engage in an active rather than a passive recruiting policy. It goes to the points where likely candidates are to be found, and it seeks to interest them in the positions it has available. It is probable that government service might well follow the example of business in this respect, and certain federal bureaus have recently done so, especially in connection with positions for which unassembled examinations are to be held.⁹

Application blanks are seldom carefully prepared to secure information relevant to the position for which application is made. Generally, some standard form is used for all types of positions. The federal government, for instance, uses its Form 8. Many of its items are not relevant for certain types of positions, especially those for which unassembled examinations are held.

While examination procedure is, on the whole, satisfactory, it appears likely that unassembled methods should be used more frequently. Such a change would permit more careful attention to highly relevant characteristics and might, at the same time, encourage applications from many well-qualified candidates who will not submit to the formal examination procedure.

Certification arrangements vary widely and are, accordingly, subject to a variety of deficiencies. Where entire registers of eligible candidates are certified to appointing officials, there is no advantage in superior performance on examinations, and the selective effects of such tests, recorded in competitive scores, are ignored. In many cases, registers are allowed to become so old that most of those whose names appear on them are no longer interested in securing positions in the public service. Probably the only method

⁹ See, Vollmer, August, "The Selection and Distribution of Police Personnel," *City Manager Yearbook*, pp. 140-148, Chicago, 1931.

of avoiding this difficulty is one which provides for examinations at regular intervals.

More serious are the restrictions placed upon certification by executive or legislative order. One of these, as far as the federal service is concerned, is the "apportionment" requirement which forces personnel officials to allocate appointments according to the geographic area from which candidates come. It applies to some 40,000 positions in the federal service. In the states, the same objection may be made to requirements that applicants shall be residents of the state.

Veterans' preference rules have a similar effect. In the federal service, a veteran secures a stipulated addition to his earned rating on account of his status as a veteran, and that addition is increased if he has a disabled status. Since present rules permit many veterans who have been disabled since the war to achieve the disabled veteran status, this provision interferes seriously with the selective influence of merit provisions.¹⁰ The same difficulty is encountered in many state services.

A similar result, as far as the federal service is concerned, results from the Coolidge executive order of March 2, 1929, which permits large numbers of "emergency" appointments from among those who have not earned passing grades in examinations for positions.

More extensive use of a system of probation would probably improve the character of the government service. In most cases, once the appointment is made, appointees assume that they need only perform perfunctorily to hold the position indefinitely.

Discrimination against women has been a feature of most branches of the public service in the past and it remains in several of the smaller jurisdictions. In the federal service,

¹⁰ See, "Preference for Veterans in the Federal Service of the United States," *Public Personnel Studies*, January-February, 1931, Vol. 9, No. 1, pp. 10-13.

women are now eligible for examinations for all positions for which they are physically fitted, and they receive equal pay for equal work in governmental positions. They are certified in equal numbers except in those cases where the appointing authority expresses a preference. The number of women in scientific and subprofessional positions is constantly increasing, as a result of this policy.¹¹

Two organizations have taken the lead in attempting to improve the public services of national and local units. One of them is the Assembly of Civil Service Commissions, which fostered the organization of the Bureau of Public Personnel Administration in 1923. The Bureau is the technical and research agency for the Assembly and has proved itself a valuable instrument in discovering and testing new policies and practices for the public service. The other major organization is the National Civil Service Reform League. Both have contributed greatly to the improvement of personnel policies in the public service.

More recently, popular attention has been directed to the shortcomings of the public services throughout the nation by the hearings and reports of the Commission of Inquiry on Public Service Personnel. The Commission was appointed by the Social Science Research Council, with the approval of President Franklin D. Roosevelt. It grew out of recommendations made by a Research Committee on Social Trends, appointed by President Hoover. The Commission of Inquiry held hearings throughout the major cities of the United States, and it investigated the civil services of several other nations. Its suggestions for a permanent "career service" in government are unquestionably the most comprehensive and carefully formulated that have appeared.¹²

In concluding this reference to the limitations of public

¹¹ See, Saint, Avice Marion, "Women in the Public Service," *ibid.*, pp. 14-19.

¹² Note the publications of the Commission in the supplementary readings at the end of this chapter.

personnel policies, possibly no brief statement could be more suggestive than the summary of the program now sponsored by the National Civil Service Reform League, an organization which, since 1881, has waged a non-partisan campaign for the merit system in the public service. It emphasizes, of course, certain changes not directly related to personnel policies, but, for the most part, its suggested changes have obvious and important implications for these policies. A statement of the program emphasizes the following desirable features of a satisfactory public service: ¹⁸

1. A central personnel agency equipped with adequate technical staff and with sufficient funds to administer the law effectively;
2. A survey of the salaries paid to all public employees in order to classify positions according to title and compensation, so that those performing substantially the same services shall be grouped in one class, and salaries fixed according to duties performed and responsibilities assumed;
3. A compensation plan uniform in its application to all similar classes of positions, with schedules of intermediate salary increments and designated lines of promotions to the higher grades and positions;
4. A probationary period to supplement the competitive examinations conducted by the personnel agency;
5. A plan for practical instruction on the job or preliminary to assignment;
6. Service ratings to determine actual performance of duties;
7. Uniform rules governing leaves of absence with or without pay; compensation in case of injury, and vacations;
8. Provision for promotions and transfers;
9. An arrangement for pooling personnel for seasonal or emergency requirements;

¹⁸ From Montgomery, W. W., "Problems and Progress of the Merit System," *Annals of the American Academy of Political and Social Science*, January, 1937, Vol. 189, pp. 195-196. See, also, Mosher, William E., "A Critique of Federal Personnel Policies as Applied to the Professional Social Positions," *American Economic Review*, March, 1937, Vol. 27, No. 1, pp. 199-209; Majoewsky, Walter V., "Maximum Age Limits at the Time of Employment," *Public Personnel Studies*, May, 1930, Vol. 8, No. 5, pp. 67-72; Davies, W. Rupert, "Why I Believe in the Patronage System," *National Municipal Review*, January, 1930, Vol. 19, No. 1, pp. 18-21; Griffenhagen, Edwin O., "The Merit System in Chicago and Cook County," *ibid.*, November, 1929, Vol. 18, No. 11, pp. 690-695; Pfiffner, John M., "Trends in Public Personnel Organization," *American Political Science Review*, April, 1932, Vol. 26, No. 2, pp. 324-332; "Building up a Municipal Personnel System," *Public Personnel Studies*, January, 1929, Vol. 7, No. 1, pp. 3-7.

10. A plan for in-service training to develop talent for higher administrative and supervisory positions;
11. A properly conceived system of separations from the service, through resignation, retirement and removal;
12. Certification of pay rolls by the personnel agency;
13. An adequate pension system;
14. Prohibition against political assessments and contributions, as well as undue political activity;
15. Supervision and investigation of the administration of the law by the personnel agency;
16. Provision for a taxpayer's action to restrain payment of compensation to persons unlawfully appointed or employed.

Exercises and Problems

1. Prepare a report on one of the articles or studies mentioned in footnotes throughout the chapter.
2. Prepare a report on one of the monographs published by the Commission of Inquiry on Public Service Personnel.
3. Criticize the methods of analysis described in "The Statistical Evaluation of Test Results," *Public Personnel Studies*, January, 1928, Vol. 6, No. 1, pp. 2-11.
4. Given the following distribution of examination scores and later service ratings:
 - (a) Measure the correlation between the two series.
 - (b) Evaluate the coefficient thus obtained by reference to charts of 5 per cent and 1 per cent significance.
 - (c) Predict the rating for an applicant whose examination score is 70.
 - (d) Indicate the standard error of this estimate.

Employee	Examination	
	Score	Rating
	X	Y
A	50	60
B	60	70
C	80	90
D	80	85
E	60	65
F	70	75
G	50	70
H	60	65
I	45	70
J	55	60
K	95	90
L	45	60
M	25	60
N	35	60
O	80	85
P	60	90
Q	50	70
R	35	60
S	45	70
T	75	90

Collateral Reading

- Annals of the American Academy of Political and Social Science*, Vol. 189, "Improved Personnel in Government Service," January, 1937.
- Better Government Personnel*, Commission of Inquiry on Public Service Personnel. New York: McGraw-Hill Book Company, Inc., 1935.
- Monographs resulting from the work of the Commission:
Civil Service Abroad: Great Britain, Canada, France, Germany.
Problems of the American Public Service.
- Greer, Sarah, *A Bibliography of Civil Service and Personnel Administration.*
- Walker, Harvey, *Training Public Employees in Great Britain.*
- Wilmerding, Lucius, *Government by Merit. An Analysis of the Problem of Government Personnel.*
(All published by McGraw-Hill Book Company, Inc., New York.)
- Bettors, Paul V., *The Personnel Classification Board.* Washington: Brookings Institution, 1931.
- Brown, Ann Duncan, *A List of References on the Civil Service and Personnel Administration in the United States.* Washington: Library of Congress, 1936.
- Closing Report of Wage and Personnel Survey*, Personnel Classification Board. Washington: Government Printing Office, 1931.
- Feldman, Herman, *A Personnel Program for the Federal Civil Service*, House Document No. 773, 71st Congress, third session. Washington: Government Printing Office, 1931.
- Lambie, Morris B., editor, *Training for Public Service.* Chicago: Public Administration Service, 1935.
- Mosher, Wm. E., and Kingsley, Donald, *Public Personnel Administration.* New York: Harper & Brothers, 1936.
- O'Rourke, L. J., *New Emphasis in Federal Personnel Research and Administration.* Washington: Government Printing Office, 1930.
- White, L. D., *Further Contributions to the Prestige Value of Public Employment.* Chicago: University of Chicago Press, 1932.
- Willoughby, W. F., *Principles of Public Administration.* Baltimore: Johns Hopkins Press, 1927.

CHAPTER XXIV

Research

IT is widely recognized that if management is to improve as it should, if it is to solve the increasingly complicated problems with which it is faced, constant research is essential, and that is as true of personnel aspects of management as of any others. It is, therefore, important that those who are charged with the responsibility for personnel policies and programs shall constantly study all phases of the problems with which they deal, from the preliminary job analyses, discovery of sources, and selection to the service functions they provide, to discover how successfully each is performing its function and how that performance may be improved. Some of the more commonly utilized methods of investigation and evaluation have been suggested in preceding chapters; many other possible approaches to specific situations will appear to the alert personnel officer.

In a sense, of course, research in personnel is coextensive with personnel management. It necessarily covers every aspect of the field. Every new policy should be founded upon a careful study of its probable effects, and every old policy must be constantly revalued in the light of its current usefulness. Such investigation and evaluation represent a most important part of all personnel research, for upon their continued use depends, in large measure, the success of the individual personnel program.

It is essential, if the full possibilities of research in terms of resulting improvements in the efficient use of labor resources are to be gained, that those responsible for personnel administration keep abreast of developments, discoveries, and investigations both in process or completed by other

students of personnel problems, whether the latter be officials facing such problems in business or scientists engaged in more generalized research in scientific laboratories. To maintain this necessary familiarity with current developments in the field requires a continuing contact with its literature. It is necessary, in other words, if personnel officers are to keep abreast of current discoveries, experiences, and developments, that they be familiar with the extensive current literature of the field.

Generally speaking, the alert student of the problems of personnel will find three principal sources of information with respect to current developments of greatest value. One of these is the group of journals and magazines that deal with problems of management, especially those that specialize in problems of industrial relations. Another is composed of the new books that are constantly appearing. They can be discovered from notices and reviews in the journals and magazines mentioned. A third is made up of the associations, committees, foundations, boards, university divisions and departments, and other organizations that regularly undertake and maintain research in the field of management and its specialized phases.

To assist those who are interested in becoming acquainted with these sources, the following paragraphs describe briefly the most important publications and associations. Neither the list of publications nor that of associations is complete, because the ramifications of the field of industrial relations are so extensive and so divergent, and they impinge upon so many other fields, including especially other aspects of management, labor problems, public health, social legislation, political organization, and other similar and allied spheres of interest that articles and investigations of interest to students of personnel may be included or described in publications whose major interest is not at all that of personnel managers. In the same way, associations that are only incidentally concerned with industrial relations frequently undertake projects having significant applications in that field.

Nevertheless, the summaries may have some value in identifying at least the more important publications and organizations.

Publications. Publications in which various phases of industrial relations are most frequently discussed make up the first list. If a publication is known to be closely allied with or sponsored by an organization, the latter is indicated in parentheses. The list includes:

1. *Aera* (American Electric Railway Association), 292 Madison Avenue, New York. Monthly, since August, 1912; suspended publication, 1932. Engineering viewpoint and problems predominate.
2. *American Economic Review* (American Economic Association), Evanston, Illinois.
3. *American Journal of Psychology* (Cornell University), Ithaca, New York. Quarterly, since November, 1887. Emphasizes experimental psychology.
4. *American Labor Legislation Review*, American Association for Labor Legislation, 131 East 23 Street, New York.
5. *British Journal of Psychology* (British Psychological Association), Cambridge, University Press. Quarterly, since 1904. General psychology, frequent articles on industrial psychology.
6. *Conference Board Service Letter* (National Industrial Conference Board, Inc.), 247 Park Avenue, New York. Monthly. Continuing series on wages, hours, and related conditions. Reports of investigations in numerous phases of industrial relations.
7. *Factory Management and Maintenance*, McGraw-Hill Publishing Company, New York. Monthly, since March, 1933. Formerly, *Maintenance Engineering and Factory and Industrial Management*. Deals with all phases of management, frequent articles on wages, incentives, working conditions, etc.
8. *Harvard Business Review*, edited under the direction of the faculty of the Harvard Graduate School of Business Administration, Cambridge, Massachusetts. Quarterly, since October, 1922. A review of the general field of business. Frequent articles on personnel problems.
9. *Human Factor* (British National Institute of Industrial Psychology), Aldwych House, London, W. C. 2. Monthly, since January, 1922. Special interest: all aspects of industrial and business psychology. Good abstracting.
10. *Industrial Psychology*, Hamilton, New York. Monthly, since January, 1926. Suspended publication in 1928. Special interest indicated by title.
11. *International Labour Review*, International Labor Office, Geneva. Monthly, since 1919. Special articles deal with all aspects of labor

- relations. Statistical section maintains continuing series on wages, hours, and other conditions of employment.
12. *Journal of Applied Psychology* (Ohio University), Athens, Ohio. Bimonthly, since 1917. All phases of applied psychology.
 13. *Journal of General Psychology* (Clark University), Worcester, Massachusetts. Quarterly, since 1928. Experimental and clinical psychology.
 14. *Journal of the American Statistical Association* (American Statistical Association), 722 Woodward Bldg., Washington, D. C. Quarterly, since 1889. Frequent critical analyses of statistics of employment, labor turnover, and related aspects of industrial relations.
 15. *Management Review* (American Management Association), 330 West 42 Street, New York. Monthly, since May, 1912. Frequent articles on personnel.
 16. *Monthly Labor Review*, Bureau of Labor Statistics, U. S. Department of Labor, Washington, D. C. Since July, 1915. Summaries of studies in industrial relations. Statistical section includes continuing series on industrial disputes, employment, payrolls, cost of living.
 17. *National Safety News* (National Safety Council), 20 North Wacker Drive, Chicago. Monthly, since July, 1920. Accident accounting and prevention.
 18. *Occupational Index* (National Occupational Conference), 551 Fifth Avenue, New York. Monthly, since January, 1936. Annotated list of current references on occupational opportunities, requirements, and trends.
 19. *Occupations: The Vocational Guidance Magazine* (National Occupational Conference), 551 Fifth Avenue, New York. Nine times per year, since 1922. Special interest indicated by title.
 20. *Personnel* (American Management Association), 330 West 42 Street, New York. Quarterly, since January, 1919 (suspended, November, 1921 to April, 1927). Entire field of personnel administration.
 21. *Personnel Journal* (formerly *Journal of Personnel*), Personnel Research Federation, 29 West 39 Street, New York. Monthly, except July and August, since May, 1922. Entire field of personnel administration.
 22. *Psychological Review* (American Psychological Association), Lancaster, Pennsylvania. Bimonthly, since 1894. Entire field of psychology.
 23. *Public Personnel Studies* (Bureau of Public Personnel Administration), 923 East 60 Street, Chicago. Monthly, since October 15, 1923; suspended, February, 1931. Personnel problems of public administration.
 24. *Quarterly Journal of Economics* (Harvard University), Cambridge, Massachusetts. Since October, 1886. Major emphasis on eco-

- conomic theory, but frequent articles on employment conditions and industrial relations.
25. *Society for Advancement of Management Journal* (formerly *Taylor Society Bulletin*), Federated Management Societies, 29 West 39 Street, New York. Bimonthly, since December, 1914. All phases of management.
 26. *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington, D. C. Monthly, since August, 1921. Mainly summaries of statistical data, including continuing series on wages, hours, industrial disputes, labor turnover, employment, cost of living, and similar information.

As has been indicated in the individual notes respecting each of these publications, several of them have at least temporarily suspended publication. They are included in the list because there is the possibility that they may resume, and because their files contain many worth-while contributions.

In addition to the journals mentioned, there are several abstracting services that may be found extremely useful. Of course, many of the journals provide some abstracts, and most of them contain references to current articles in other publications. Among the most valuable specialized abstracting services are the following:

1. *Psychological Abstracts* (American Psychological Association), Worcester, Massachusetts. Monthly, since 1926. Special section devoted to "Personnel and Industrial Problems."
2. *Social Science Abstracts*, 611 Fayerweather Hall, Columbia University, New York. Monthly, since 1929; suspended publication, December, 1932. Special sections on "Labor and Wages," "Labor Relations," "Personnel," "Health and Safety," "Employment and Unemployment."

For assistance in preparing preliminary bibliographies, the *Industrial Arts Index*, published since 1913 by the H. W. Wilson Company, 950 University Avenue, New York, will be found valuable, as will the *Public Affairs Information Service*, released by the organization bearing that name at 11 West 40 Street, New York, and available in most large libraries.

Personnel executives and students interested in current

legislation affecting collective bargaining, unemployment insurance, labor standards and other aspects of industrial relations will find the frequent reports of the *Prentice-Hall Labor Service*, published by Prentice-Hall, Inc., 70 Fifth Avenue, New York, and the similar service of the Commerce Clearing House of greatest value in this connection.

Organizations and associations. It is even more difficult to prepare a selected list of organizations than to present such a roster of publications, for many associations that are not primarily interested in industrial relations have, nevertheless, sections or divisions that devote attention to some aspects of the field. On the other hand, it is extremely important for the alert student of personnel administration to recognize the possible contributions of such organizations in their bulletins and similar publications. The following summary attempts to indicate not only the name, address, and principal interest of the most important of these associations, but to suggest the likely form of their reports and releases.

1. American Association for Labor Legislation, 131 East 23 Street, New York. Organized in 1906 as a branch of the International Association for Labor Legislation. Publishes the *American Labor Legislation Review*, quarterly, and numerous pamphlets presenting a viewpoint sympathetic to labor.
2. American Management Association, 330 West 42 Street, New York. Founded 1922, by the union of the National Association of Corporate Training (1913) and the Industrial Relations Association (1918) as the National Personnel Association. Name changed to present title in 1923. Publishes *Personnel*, *Management Review* and several series in which frequent discussions of personnel problems appear.
3. American Public Health Association, 50 West 50 Street, New York. Maintains a section on Industrial Hygiene and publishes studies and reports in this field in the Association's *American Journal of Public Health*.
4. American Society of Mechanical Engineers, 29 West 39 Street, New York. Organized 1880, with four divisions, three of which, the Management Division, the Safety Committee, and the Committee on Education, are of interest to students of personnel. Publishes *Mechanical Engineering* (monthly) and *Transactions* of the various divisions.
5. American Society of Safety Engineers (the engineering section of

- the National Safety Council). Publishes safety practice reports in pamphlet form.
6. Bureau of Labor Statistics, originally established in the Department of the Interior in June, 1884; after several transfers, placed in the Department of Labor in 1913. Publishes *Monthly Labor Review* (monthly), *Labor Information Service* (monthly), *Handbook of Labor Statistics* (biennially), and numerous bulletins.
 7. Bureau of Personnel Administration, 420 Lexington Avenue, New York. Since 1925, the Bureau has conducted numerous labor audits of individual concerns and has held several conferences on training programs, personnel research, counseling, and vocational guidance, such conferences being reported in a series of published volumes.
 8. Civil Service Commission, Washington, D. C. Established in 1922. Has undertaken extensive studies of problems involved in selection of personnel and maintenance of efficient public service, which are reported in the bulletins of the Commission and articles published elsewhere by the director.
 9. Industrial Health Research Board, London, England. An outgrowth of the Health of Munition Workers Committee (1915), which was replaced in 1918 by the Industrial Fatigue Research Board under the joint support of the Department of Scientific Industrial Research and the Medical Research Council. Has conducted extensive studies of the effects of varying arrangements of working hours and shifts, rest periods, atmospheric conditions, circumstances surrounding industrial accidents, and related conditions. Publishes annual reports, special reports (frequently listed under the Medical Research Council) and special papers by its ten committees in various journals.
 10. Industrial Relations Counselors, Inc., 1270 Sixth Avenue, New York. Incorporated in 1926 to undertake research in industrial relations, with support provided by John D. Rockefeller, Jr. Maintains consulting service and publishes "Library Bulletin" (Bibliography) and irregular reports of studies.
 11. Institute for Government Research, 26 Jackson Place, Washington, D. C. Instituted in 1916 to attempt studies of government. Became part of Brookings Institution in 1928. Publishes three series, "Principles of Administration," "Studies in Administration," and "Service Monographs of the United States Government," as well as special studies.
 12. International Labor Office, League of Nations Building, Geneva, or (U. S. Office) Lenox Building, Washington, D. C. Established by Section XIII of the Treaty of Versailles (1919), which provides for commissions of inquiry into the whole broad field of industrial conditions. Publications include the *International Labour Review* (monthly), *Industrial and Labour Information* (weekly), *Official Bulletin*, *Industrial Safety Survey* (bimonthly), *Bibliography of Industrial Hygiene* (quarterly), *Legislative Series* (annual), *Inter-*

national Survey of Legal Decisions on Labour Law (annual), and numerous studies and reports, several of which have referred to conditions in the United States.

13. Labor Bureau, Incorporated, 2 West 43 Street, New York. Established in May, 1920 for the purpose of providing professional services to labor organizations. Has made numerous studies of working conditions in individual industries.
14. Labor Research Association, 799 Broadway, New York. Has provided research facilities for labor organizations since 1927. Publishes a series of studies on "Labor and Industry."
15. Manufacturers' Research Association, 80 Federal Street, Boston. Association organized in 1921 by 11 industrial firms and Harvard University to provide research committees, some of which have studied personnel problems. Findings are not published but are made available to associates in mimeographed form.
16. National Association of Manufacturers, 11 West 42 Street, New York. Maintains an Industrial Relations Department and publishes pamphlets revealing results of inquiries among its members at irregular intervals.
17. National Bureau of Economic Research, 1819 Broadway, New York. The Bureau was organized in January, 1920, by a small group of economists and statisticians to provide an unbiased research agency in the general field of business. Present membership includes business firms, unions, universities, employers' associations, banks, and individuals. Supported by membership fees, grants from foundations and from the government (for special studies), and from sale of its publications. Studies of special interest to students of industrial relations include those growing out of the President's conference on unemployment, including the *Recent Economic Changes* (1929). A fourth volume of a projected statistical encyclopedia is to deal with labor statistics. Publications also include a *Bulletin* of the association, which is published five times each year.
18. National Committee for Mental Hygiene, Inc., 50 West 50 Street, New York. Founded in 1909, incorporated in 1916, as a voluntary association whose objective is the improvement of mental health. Has stimulated and engaged in cooperative research with numerous universities, state societies, and other associations; studies have emphasized the emotional aspects of personality and stressed analysis of emotional conflict, pre-occupation, emotional instability, and related conditions. Publishes *Mental Hygiene* (quarterly) and *Mental Hygiene Bulletin* (monthly), together with monographs and pamphlets.
19. National Industrial Conference Board, 247 Park Avenue, New York. Organized in May, 1916, primarily as a clearinghouse for information and a medium for cooperative investigation. Has undertaken a continuing series of studies of industrial conditions in the United States, a large portion of which have dealt with industrial relations. Publishes the *Conference Board Bulletin* (monthly), the *Conference*

Board Service Letter, formerly the *Service Letter on Industrial Relations* (monthly), *Road Maps of Industry* (twice monthly), and numerous reports in book form.

20. National Institute of Industrial Psychology (British), Aldwych House, W. C. 2, London, England. Established in 1921 to study various aspects of industrial conditions in terms of psychology and physiology. Privately supported by individual industrial concerns, both within and without the United Kingdom. Maintains an extensive staff (50 persons in 1930). Studies all phases of inefficiency and waste in use of labor power, including selection, improvement of working conditions, vocational guidance, and training and rehabilitation. Publishes *The Human Factor*, formerly known as the *Journal of the National Institute of Industrial Psychology*.
21. National Occupational Conference, 551 Fifth Avenue, New York. Organized in 1933 to foster research in vocational guidance with special emphasis upon occupational opportunities, requirements, and trends. Publishes books, pamphlets, and periodicals, including *Occupations*. Control is vested in an executive committee of eleven members, and there are technical and advisory committees. The conference is supported by an annual grant from the Carnegie Corporation.
22. National Research Council, Bond and 21st Streets, Washington, D. C. Established in 1916 under the congressional charter of the National Academy of Sciences; has three divisions whose studies are of interest to students of personnel administration, including Engineering and Industrial Research, Medical Sciences, and Anthropology and Psychology. Results of its studies are made available in a variety of journals by those who undertake them and in its reprint and circular series.
23. National Safety Council, 20 North Wacker Drive, Chicago. Founded in 1912 as a division of the Association of Iron and Steel Electrical Engineers. Some 5,300 firms held memberships in 1930. Supported by membership dues and assistance from the Rockefeller Foundation and the National Board of Casualty and Surety Underwriters. The Council maintains an elaborate publication program dealing with safety instruction in a wide range of industries. In addition to numerous bulletins, it publishes the *National Safety News* (monthly), *Public Safety* (monthly), *Safety Education* (monthly), and the *Safe Worker* (monthly).
24. Personnel Research Federation, 29 West 39 Street, New York. Outgrowth of conference on personnel research sponsored by the Engineering Foundation and the National Research Council in 1920. Federation formed in March, 1921, as a clearinghouse for personnel research agencies. Membership includes corporations, govern-

- mental agencies, educational institutions, research bureaus, and individuals. Publishes the *Personnel Journal* (bimonthly).
25. Psychological Corporation, Inc., 523 Fifth Avenue, New York. Organized in 1921 to provide competent psychological advice for industry, to conduct examinations, to distribute testing material, and to provide vocational guidance.
 26. Russell Sage Foundation, 130 East 22 Street, New York. Incorporated in 1907 to improve social and living conditions in the United States. Research has included studies of public employment exchanges, governmental intervention in industrial disputes, analyses of employment statistics, and others. Publications by staff members have appeared in various periodicals and the Foundation has an extensive catalog of its own studies.
 27. Social Science Research Council, 2715 New York Central Building, New York. Organized in 1923 to facilitate joint attack upon research problems in the social science field. Extensive endowment is utilized to provide grants-in-aid and thus to encourage research by competent students, and several committees of the Council have encouraged research in the personnel field, including investigation of the labor market, wage data, immigrant labor, restriction of output, the technique of interviewing, and others.
 28. Society of Industrial Engineers, 205 West Wacker Drive, Chicago. Formed in 1917 as an association of executives and managers to promote industrial efficiency. Some of its studies, including those on time study, elimination of fatigue, and others of similar nature are of interest to students of personnel. Publishes reports of research committees individually and in the proceedings of conventions, and the *Bulletin* of the association appears monthly.
 29. Society for the Advancement of Management, formerly the Taylor Society, Inc., 29 West 39 Street, New York. Organized in 1911 as the Society to Promote the Science of Management. The Society has local chapters and these, together with special committees appointed for that purpose, frequently undertake special investigations and studies in the general field of management, some of which are of interest to the personnel field. Depression encouraged the amalgamation of the Taylor Society and the Society of Industrial Engineers, which was accomplished in 1931. Publishes the *Society for Advancement of Management Journal*.

There are many other associations whose activities or publications occasionally present material of interest to students of industrial relations, including organizations whose field of inquiry is broad and inclusive, of which the American Medical Association and the American Federation of Labor are

typical, and also such special purpose organizations as the National Metal Trades Association (safety, wage analysis) and the National Electric Light Association (accident prevention, training.)

Special mention should be made, also, of the fact that several universities have entered upon extensive research programs in industrial relations. Notable in this connection are Princeton University (Industrial Relations Section), the University of Minnesota (Employment Stabilization Institute), the University of Pennsylvania (Department of Industrial Research of the Wharton School of Finance and Commerce), and Yale University (Institute of Human Relations). Several other institutions that have not set up distinctive divisions for this purpose are, nevertheless, through their bureaus of business research and other such agencies, engaged in valuable research in the field.

Types of research problems. A simple classification of the types of research problems that appear most frequently in the field of personnel administration might be builded about the distinction in approaches to the field described in Chapter III. As has been suggested there, many of the problems that appear most worthy of attention represent analyses of various underlying processes that are the special province of one or another of the sciences. There are, for instance, economic problems having to do with the relationship of wages and employment, labor supplies and earnings, the incidence of various social security taxes and their effects upon wages, and numerous others that must rely primarily upon a group approach to economic activity. There are, too, psychological problems, typified by analyses of the significance of individual differences in numerous aspects of employee-employer relationships, the implications of motivation, of emotional states, and of other psychological factors. Further, there are sociological problems, typical of which are analysis of conditions associated with levels of

morale and investigation of all kinds of collective behavior. There are physiological problems, studies of the physiological factors underlying performance of the labor function in industry. In addition to such problems, readily identifiable as legitimate aspects of one or another of the sciences, there are crosscutting problems that bridge the gap between individual disciplines, requiring a combination approach, illustrated by those falling into the borderland between medicine and psychology, or that between economics and psychology. Some suggestions as to the most commonly recognized of such scientific problems may be gained from the studies cited in footnotes throughout the chapters.

Other problems worthy of research arise directly out of the application of various personnel policies and practices. The evaluation of these devices, techniques, and administrative policies is the essence of such problems. In this type of research, the student seeks to discover how some policy or device is working or has worked, how effective it has been in terms of the objectives for which it was designed, what its deficiencies appear to be, what modifications appear to effect significant improvement, what features seem particularly objectionable. The study may compare systems of wage payment, different schedules of working hours, different sources, selective devices, promotional plans, transfer arrangements, loan provisions, types of employee representation plans, or other similar features. The student may seek to evaluate employee suggestion systems, life insurance provisions, pension plans, rating scales, training facilities, or housing arrangements. In every case, the problem is essentially, "How does the device fulfill its purposes?" and the purposes are defined by the objectives of management. Such problems are not, therefore, of the same nature as the scientific problems described in the preceding paragraph, but they do, on the other hand, represent legitimate and highly valuable research.

Tools and techniques. The type of tools to be used in research will depend entirely upon the nature of the problem to be studied. Each of the sciences has specialized tools that are essential to satisfactory analysis in its field. Research in these scientific fields requires a thorough acquaintance with such specialized tools, an acquaintance that can be gained only by extensive advanced study in the field in which the problem appears.

Satisfactory analysis of problems in the field of the applied science of personnel administration requires a similar familiarity with that field. As is the case with all applied sciences, the tools that may be most effectively used include some that have been developed especially for the purpose, together with any that can be appropriated from the related sciences. For study of some personnel problems, the tools will be those developed by sociology; for others those of psychology, economics, physiology, or biology may be most useful.

Many simple statistical tools of utmost importance and of wide use have been described in preceding pages. Numerous more complicated techniques may be prescribed in specific investigations. Among those that have been most effectively used are the specialized types of correlation. Multiple and partial correlation will be found to have many applications in the investigation of personnel problems, and personnel data exhibit numerous situations in which the linear measures of co-variation described in preceding chapters are not applicable. In these problems, resort has frequently been made to the *correlation ratio* or *eta coefficient*, since that device quickly indicates the presence or absence of curvilinearity in the relationship, at the same time that it provides a more satisfactory measure of co-variation where curved regressions are desirable. The detailed description of these more complicated techniques would be quite unappropriate here, but the student who desires to undertake extensive study or research in the field should familiarize himself with them. In the same way, the recently popularized technique usually described as analysis of variance will

be found to have many useful applications in certain types of personnel research.¹

The future development of any applied science depends almost entirely upon the amount and quality of the research being undertaken in that field. Recent years have seen a great increase in the number of students who have found the field of industrial relations especially attractive, so far as opportunities for research are concerned, and it appears, also, that the quality of investigations has shown definite improvement. Expansion of labor organization, increasing political activity on the part of organized labor, and the general recognition of vast opportunities for improvement in the efficient use of labor power appear likely to encourage continued interest in the field and to stimulate more extensive and more intensive research. Under the circumstances, a healthy expansion in the understanding of fundamental principles that make up the nucleus of the applied science may be confidently expected.

Exercises and Problems

Note: These problems are included to illustrate the application to personnel data of specialized statistical techniques, particularly valuable in personnel research. Detailed explanation of the techniques may be found in several recent texts in business statistics, educational statistics, psychometry, biometry, and allied fields. For convenience, specific page references are included for one recent text in business statistics, Davies and Yoder, *Business Statistics, op. cit.*, principally because that text uses personnel data as illustrative material.

A. The Correlation Ratio or Eta Coefficient (Davies and Yoder, pp. 375-379).

1. Measure the correlation involved in the data of exercise 4, Chapter VIII, by means of the correlation ratio.
2. Compare the eta coefficient with the linear coefficient of correlation, calculate eta, and determine whether or not the appropriate regression should be linear.
3. Given the summary below, in which years of service are compared with the number of times tardy in a recent year, measure the correlation by means of the eta coefficient.

¹For a detailed explanation of these techniques as applied to personnel data, see Davies, G. R., and Yoder, Dale, *Business Statistics*, Chaps. VII, VIII, and LX. New York: John Wiley & Sons, Inc., 1937.

<i>Years</i>	<i>Tardy</i>	<i>Years</i>	<i>Tardy</i>	<i>Years</i>	<i>Tardy</i>	<i>Years</i>	<i>Tardy</i>
1	26	2	31	4	25	8	23
1	28	2	37	4	26	9	22
1	29	2	32	4	30	9	21
1	39	2	36	4	20	9	18
1	39	2	29	4	19	9	17
1	30	2	38	4	22	10	8
1	31	2	35	4	30	10	14
1	32	2	32	4	29	10	15
1	26	2	37	4	24	10	16
1	41	2	33	4	29	10	19
1	49	2	35	5	26	11	21
1	43	2	29	5	28	11	22
1	39	2	36	5	26	11	23
1	42	2	31	5	28	11	21
1	48	2	35	5	24	11	23
1	34	2	30	5	28	11	22
1	47	2	33	5	25	11	19
1	24	2	32	5	28	12	18
1	23	2	21	5	26	12	17
1	22	2	19	5	20	12	23
1	12	3	11	6	19	12	21
1	13	3	12	6	21	12	19
1	21	3	14	6	27	12	18
1	24	3	15	6	27	12	23
1	47	3	16	6	25	12	22
1	35	3	22	6	27	13	21
1	45	3	24	6	24	13	20
1	42	3	34	6	27	13	20
1	46	3	31	6	26	13	19
1	29	3	32	6	28	13	3
1	34	3	29	6	24	13	14
1	46	3	36	6	26	14	16
1	33	3	33	6	25	14	18
1	44	3	31	6	27	14	17
1	26	3	35	6	24	14	16
1	48	3	32	7	8	15	1
1	40	3	25	7	9	15	15
1	34	3	26	7	10	15	9
1	44	3	34	7	11	15	11
1	33	3	30	7	12	15	10
2	39	4	34	7	14	16	5
2	38	4	31	7	15	16	13
2	29	4	29	7	16	16	7
2	37	4	34	7	18	17	14
2	36	4	32	7	19	17	6
2	37	4	34	8	17	17	14
2	32	4	31	8	20	18	13
2	43	4	30	8	21	18	7
2	34	4	38	8	23	19	12
2	28	4	24	8	21	19	5

4. Compare the eta coefficient in the preceding exercise with the linear coefficient of correlation and state your conclusions as to the adequacy of the linear regression.

5. Analyze the following data, which compares admission test scores and ratings for seventy-five employees of a retail store; and measure the correlation by the eta coefficient:

<i>Test Score</i>	<i>Rating</i>	<i>Test Score</i>	<i>Rating</i>
64	71	88	87
64	72	86	87
83	73	84	87
83	74	79	87
75	76	76	87
76	76	71	88
76	78	76	88
76	80	79	88
76	86	83	88
79	79	86	88
89	81	87	88
86	81	90	88
83	81	93	89
80	81	92	89
77	81	89	89
74	81	85	89
71	81	81	90
69	81	77	90
75	82	74	90
78	82	71	91
81	82	76	91
83	82	80	91
86	82	84	91
88	82	87	91
91	84	89	92
88	84	84	92
84	84	83	92
80	84	82	92
74	84	79	92
86	85	85	95
82	85	83	95
86	86	84	95
90	86	80	95
91	86	84	96
91	86	83	96
91	86	80	96
90	87	81	97
		82	97

6. Compare the eta coefficient discovered in exercise 5 with the linear coefficient of correlation for the same data. Is a curved regression justified by the data?

B. Use of a Parabolic Regression (Davies and Yoder, pp. 351-362).

7. Fit a parabolic regression to the data of each of the following exercises, and calculate the index of correlation:

- (a) Exercise 4, page 173.
- (b) Exercise 6, page 200.
- (c) Exercise 5, page 590.

C. Multiple Correlation (Davies and Yoder, pp. 320-335).

8. Management seeks to improve selection by discovering co-variation between significant characteristics of applicants and later performance records. It finds the correlation between college grades (expressed in percentile form) and sales (monthly, in thousands of dollars) to be,

$r = 0.80$, and the similar correlation between entrance test scores and sales to be, $r = 0.90$. The measures of the three distributions may be summarized as follows: (1) standard deviations: sales, 0.08; college grades, 0.50; entrance test scores, 1.0; (2) means: sales, 5.0; college grades, 70; entrance test scores, 80. The number of cases analyzed is 100.

- (a) Discover the multiple coefficient of correlation.
- (b) Set up the multiple regression equation and predict sales for one whose college grades average 90 and whose test score is 80.
- (c) Indicate the limits within which sales for the given individual are practically certain to fall (three standard errors of estimate).

9. Management seeks to discover whether certain suspected conditions may be significantly related to arbitrary quits among its employees. It compares quit rates in ten months with measures of the other conditions (data reduced for problem purposes) as follows:

Month	Quit Rates	Overtime Hours	Weekly Hours
1	.6	4	24
2	.8	5	30
3	1.0	6	32
4	1.2	8	35
5	1.7	5	34
6	.5	2	21
7	.7	1	22
8	.9	7	26
9	1.1	5	40
10	1.5	7	36

- (a) Calculate the simple coefficients of correlation.
- (b) Calculate the multiple coefficient.
- (c) Note the standard errors of each of the above coefficients.
- (d) Predict the quit rate for a month having weekly hours of 28 and average overtime, 5. Note the standard error of estimate.

10. Analyze the following data, discovering simple coefficients of correlation measuring the co-variation among the series, and calculating the multiple coefficient. Note the significance of each of these coefficients by calculating standard errors and by reference to the charts of significance.

Promotions Per Year (Y)	Education, Years (X ₁)	Previous Experience (X ₂)
1	3	1
2	4	4
2	5	2
3	8	5
4	9	4
4	10	6
5	11	6
6	12	5
6	14	10
7	6	7

11. Management has prepared the following comparison of average monthly commissions, admission test scores, years of service, and education. Calculate the simple correlation coefficients measuring relationships between the series. Evaluate their significance, and combine the highly significant values in a multiple regression equation for estimating purposes. Estimate monthly commissions for three workmen, and calculate the multiple coefficient for the highly significant interrelationships.

Average Monthly Commissions (in \$100) Y	Admission Test Scores X ₁	Years of Service X ₂	Education, Years X ₃
2.6	72	3	12
3.0	74	4	10
5.0	76	9	12
3.2	78	8	6
3.4	80	6	7
3.6	82	5	5
3.2	84	5	8
6.0	86	3	8
4.2	88	16	11
2.7	90	13	7
4.5	92	11	8
4.9	93	3	8
4.2	96	15	10
5.0	97	14	10
1.5	50	2	10
2.5	55	12	8
1.7	57	5	11
1.8	58	3	11
3.0	60	7	12
1.6	62	4	8
1.9	65	5	8
2.0	66	8	6
4.0	67	18	8
2.1	69	3	12
2.4	70	1	12

D. Partial Correlation (Davies and Yoder, pp. 335-340).

12. Measure the partial coefficients of correlation for each of the comparisons made in exercise 10 above. Note also the standard error of these net coefficients, and set up estimating equations based on these net coefficients. Estimate promotions for an employee having 11 years of education, and for one with 7 years of previous experience, using the net regression coefficients.

13. Using the data of exercise 11 above, calculate partial correlation coefficients for the co-variation of test scores and commissions, experience and commissions, and education and commissions. Derive the net regression equations for each of these relationships.

Evaluate each of the partial coefficients by reference to the charts in Appendices G and H.

E. Variance Analysis (Davies and Yoder, pp. 406-425).

14. Using the method of variance analysis, determine whether there is a significant seasonal variation in the data of industrial disputes beginning in the month. Use the data since 1927 (revised, See *Survey of Current Business*, July, 1937, p. 19) and extending through the last full year for which such data is available.

Similarly determine whether there is a significant year-to-year pattern in the trend of industrial disputes. Use the method of dual variance analysis.

15. By means of analysis of variance, determine whether there is significant difference between numbers of accidents per hundred workers in the seven plants compared in the tabulation below. Determine also whether there is significant variation from month to month.

<i>Number of Accidents per Hundred Workers</i>							
<i>Month</i>	<i>Plant 1</i>	<i>Plant 2</i>	<i>Plant 3</i>	<i>Plant 4</i>	<i>Plant 5</i>	<i>Plant 6</i>	<i>Plant 7</i>
1	2	1	4	5	3	4	5
2	3	4	3	4	2	5	5
3	5	3	7	6	7	5	7
4	4	2	6	5	6	6	7
5	7	5	7	9	4	7	10
6	6	8	9	7	6	6	12
	27	23	36	36	28	33	46

APPENDICES

APPENDIX A

INDUSTRIES FOR WHICH CURRENT REPORTS OF EMPLOYMENT ARE AVAILABLE

The following list includes the eighty-nine manufacturing industries and the sixteen nonmanufacturing industries for which monthly samples of employment are secured by the Bureau of Labor Statistics. Employment changes in these industries are summarized in the *Monthly Labor Review* and in mimeographed releases available from the Bureau.

MANUFACTURING INDUSTRIES

Durable-goods groups

Iron and steel and their products	Transportation equipment (cont.)
Blast furnaces and rolling mills	Cars, electric and steam rail- road
Bolts, nuts, washers, and rivets	Locomotives
Cast-iron pipe	Shipbuilding
Cutlery and edge tools	Railroad repair shops
Forgings, iron and steel	Electric railroad
Hardware	Steam railroad
Plumbers' supplies	Nonferrous metals and their pro- ducts
Steam and hot-water heating ap- paratus and steam fittings	Aluminum manufactures
Stoves	Brass, bronze, and copper pro- ducts
Structural and ornamental metal work	Clocks and watches
Tin cans and other tinware	Jewelry
Tools	Lighting equipment
Wirework	Silverware and plated ware
Machinery	Smelting and refining—copper, etc.
Agricultural implements	Stamped and enameled ware
Cash registers, adding machines, etc.	Lumber and allied products
Electrical machinery and sup- plies	Furniture
Engines, turbines, and tractors	Lumber
Foundry and machine-shop pro- ducts	Millwork
Machine tools	Sawmills
Radios and phonographs	Stone, clay, and glass products
Textile machinery and parts	Brick, tile, and terra cotta
Typewriters and parts	Cement
Transportation equipment	Glass
Aircraft	Marble, granite, slate, and other products
Automobiles	Pottery

Nondurable-goods groups

Textiles and their products	Chemicals and allied products
Fabrics	(cont.)
Carpets and rugs	Leather
Cotton goods	Food and kindred products
Cotton small wares	Baking
Dyeing and finishing textiles	Beverages
Hats; fur, felt	Butter
Knit goods	Canning and preserving
Silk and rayon goods	Confectionery
Woolen and worsted goods	Flour
Wearing apparel	Ice cream
Clothing, men's	Slaughtering and meat
Clothing, women's	packing
Corsets and allied garments	Sugar, beet
Men's furnishings	Sugar refining, cane
Millinery	Tobacco manufactures
Shirts and collars	Chewing and smoking to-
Paper and printing	bacco and snuff
Boxes, paper	Cigars and Cigarettes
Paper and pulp	Explosives
Printing and publishing	Fertilizers
Book and job	Paints and varnishes
Newspapers and periodicals	Rayon and allied products
Chemicals and allied products, and	Soap
petroleum refining	Petroleum refining
Other than petroleum refining	Rubber products
Chemicals	Rubber boots and shoes
Cottonseed oil, cake, and meal	Rubber goods, other than boots,
Druggists' preparations	shoes, tires, and inner
Leather and its manufactures	tubes
Boots and shoes	Rubber tires and inner tubes

NONMANUFACTURING INDUSTRIES

Coal mining	Public utilities (cont.)
Anthracite	Telephone and telegraph
Bituminous	Trade
Metalliferous mining	Wholesale
Quarrying and nonmetallic mining	Retail
Crude petroleum producing	Hotels (year-round)
Public utilities	Laundries
Electric light and power and	Dyeing and cleaning
manufactured gas	Brokerage
Electric-railroad and motor-bus	Insurance
operation and maintenance	Building construction

APPENDIX B

ESTIMATES OF EMPLOYMENT

TOTAL NONAGRICULTURAL EMPLOYMENT IN THE UNITED STATES, BY MONTHS, 1929 TO 1937

Employment on federal emergency construction has been included in these estimates only when such construction is carried out in a manner essentially similar to private work or regular government work. Thus, employment on P.W.A. projects has been included, as has employment on projects under the supervision of the Bureau of Public Roads. Other federal emergency projects have been excluded.

(In thousands of persons)

Month	1929	1930	1931	1932	1933	1934	1935	1936	1937
Average.....	36,158	33,927	30,851	27,623	27,663	30,167	31,346	32,975	.....
January.....	34,898	34,641	31,426	28,579	26,241	28,688	30,154	31,416	33,340
February.....	35,045	34,351	31,059	28,389	26,180	29,173	30,465	31,428	33,655
March.....	35,377	34,293	31,201	28,206	25,897	29,760	30,761	31,840	34,138
April.....	35,879	34,540	31,499	27,993	26,269	30,184	31,146	32,401	.....
May.....	36,276	34,664	31,530	27,689	26,672	30,608	31,219	32,761	.....
June.....	36,569	34,494	31,419	27,389	27,345	30,706	31,288	33,092	.....
July.....	36,684	34,081	31,052	27,015	27,827	30,462	31,288	33,297	.....
August.....	37,019	33,788	30,807	27,023	28,598	30,478	31,570	33,477	.....
September.....	37,068	33,714	30,699	27,366	29,218	30,304	31,866	33,797	.....
October.....	37,044	33,457	30,375	27,582	29,469	30,611	32,193	34,069	.....
November.....	36,421	32,828	29,734	27,287	29,214	30,450	32,053	33,953	.....
December.....	35,634	32,274	29,410	26,953	29,024	30,578	32,146	34,171	.....

Source: "Nonagricultural Employment in the United States, March, 1937," *Monthly Labor Review*, June, 1937, Vol. 44, No. 6, p. 1421.

APPENDIX C

COVERAGE OF UNEMPLOYMENT COMPENSATION, AVERAGE FOR 1930

State	Number (In thousands)	Per Cent of Total Gainful Workers
United States.....	22,279	45.6
Alabama.....	312	30.4
Arizona.....	73	44.2
Arkansas.....	164	24.6
California.....	1,267	50.7
Colorado.....	172	42.7
Connecticut.....	372	54.9
Delaware.....	47	47.9
District of Columbia.....	112	46.0
Florida.....	271	45.2
Georgia.....	382	32.9
Idaho.....	56	34.5
Illinois.....	1,645	51.7
Indiana.....	580	46.4
Iowa.....	337	36.9
Kansas.....	270	38.9
Kentucky.....	320	35.3
Louisiana.....	301	36.9
Maine.....	149	48.3
Maryland.....	341	50.7
Massachusetts.....	1,019	56.2
Michigan.....	978	50.7
Minnesota.....	400	40.3
Mississippi.....	170	20.1
Missouri.....	630	43.2
Montana.....	79	36.5
Nebraska.....	179	35.3
Nevada.....	20	46.6
New Hampshire.....	99	51.4
New Jersey.....	959	56.0
New Mexico.....	49	34.3
New York.....	3,084	55.8
North Carolina.....	371	32.5
North Dakota.....	62	25.8
Ohio.....	1,337	51.1
Oklahoma.....	304	36.7
Oregon.....	190	46.4
Pennsylvania.....	2,013	54.1
Rhode Island.....	167	56.2
South Carolina.....	197	28.6
South Dakota.....	68	27.5
Tennessee.....	340	35.5
Texas.....	795	36.0
Utah.....	75	44.1
Vermont.....	60	42.5
Virginia.....	352	40.0
Washington.....	325	48.9
West Virginia.....	263	46.1
Wisconsin.....	487	43.1
Wyoming.....	36	38.9

APPENDIX D

NATIONAL LABOR RELATIONS ACT

THE National Labor Relations Act, or the Wagner Act as it is sometimes called, was approved by the President, July 5, 1935. The full text of the law follows:

SECTION 1. *Findings and policy.*—The denial by employers of the right of employees to organize and the refusal by employers to accept the procedure of collective bargaining lead to strikes and other forms of industrial strife or unrest, which have the intent or the necessary effect of burdening or obstructing commerce by (a) impairing the efficiency, safety, or operation of the instrumentalities of commerce; (b) occurring in the current of commerce; (c) materially affecting, restraining, or controlling the flow of raw materials or manufactured or processed goods from or into the channels of commerce, or the prices of such materials or goods in commerce; or (d) causing diminution of employment and wages in such volume as substantially to impair or disrupt the market for goods flowing from or into the channels of commerce.

The inequality of bargaining power between employees who do not possess full freedom of association or actual liberty of contract, and employers who are organized in the corporate or other forms of ownership association substantially burdens and affects the flow of commerce, and tends to aggravate recurrent business depressions, by depressing wage rates and the purchasing power of wage earners in industry and by preventing the stabilisation of competitive wage rates and working conditions within and between industries.

Experience has proved that protection by law of the right of employees to organize and bargain collectively safeguards commerce from injury, impairment, or interruption, and promotes the flow of commerce by removing certain recognized sources of industrial strife and unrest, by encouraging practices fundamental to the friendly adjustment of industrial disputes arising out of differences as to wages, hours, or other working conditions, and by restoring equality of bargaining power between employers and employees.

It is hereby declared to be the policy of the United States to eliminate the causes of certain substantial obstructions to the free flow of commerce and to mitigate and eliminate these obstructions when they have occurred by encouraging the practice and procedure of collective bargaining and by protecting the exercise by workers of full freedom of association, self-organization, and designation of representatives of their

own choosing, for the purpose of negotiating the terms and conditions of their employment or other mutual aid of protection.

Sec. 2. Definitions.—When used in this act—

(1) The term “person” includes one or more individuals, partnerships, associations, corporations, legal representatives, trustees, trustees in bankruptcy, or receivers.

(2) The term “employer” includes any person acting in the interest of an employer, directly or indirectly, but shall not include the United States, or any State or political subdivision thereof, or any person subject to the Railway Labor Act, as amended from time to time, or any labor organization (other than when acting as an employer), or anyone acting in the capacity of officer or agent of such labor organization.

(3) The term “employee” shall include any employee, and shall not be limited to the employees of a particular employer, unless the act explicitly states otherwise, and shall include any individual whose work has ceased as a consequence of, or in connection with, any current labor dispute or because of any unfair labor practice, and who has not obtained any other regular and substantially equivalent employment, but shall not include any individual employed as an agricultural laborer, or in the domestic service of any family or person at his home, or any individual employed by his parent or spouse.

(4) The term “representatives” includes any individual or labor organization.

(5) The term “labor organization” means any organization of any kind, or any agency or employee representation committee or plan, in which employees participate and which exists for the purpose, in whole or in part, of dealing with employers concerning grievances, labor disputes, wages, rates of pay, hours of employment, or conditions of work.

(6) The term “commerce” means trade, traffic, commerce, transportation, or communication among the several States, or between the District of Columbia or any Territory of the United States and any State or other Territory, or between any foreign country and any State, Territory, or the District of Columbia, or within the District of Columbia or any Territory, or between points in the same State but through any other State or any Territory or the District of Columbia or any foreign country.

(7) The term “affecting commerce” means in commerce, or burdening or obstructing commerce or the free flow of commerce, or having led or tending to lead to a labor dispute burdening or obstructing commerce or the free flow of commerce.

(8) The term “unfair labor practice” means any unfair labor practice listed in section 8.

(9) The term “labor dispute” includes any controversy concerning terms, tenure, or conditions of employment, or concerning the association or representation of persons in negotiating, fixing, maintaining, changing, or seeking to arrange terms or conditions of employment, regardless of whether the disputants stand in the proximate relation of employer and employee.

(10) The term "National Labor Relations Board" means the National Labor Relations Board created by section 3 of this act.

(11) The term "old Board" means the National Labor Relations Board established by Executive Order No. 6763 of the President on June 29, 1934, pursuant to Public Resolution No. 44, approved June 19, 1934 (48 Stat. 1183), and reestablished and continued by Executive Order No. 7074 of the President of June 15, 1935, pursuant to title I of the National Industrial Recovery Act (48 Stat. 195) as amended and continued by Senate Joint Resolution 113 approved June 14, 1935.

Sec. 3. *Creation of National Labor Relations Board.*—(a) There is hereby created a board, to be known as the "National Labor Relations Board" (hereinafter referred to as the "Board"), which shall be composed of three members, who shall be appointed by the President, by and with the advice and consent of the Senate. One of the original members shall be appointed for a term of 1 year, one for a term of 3 years, and one for a term of 5 years, but their successors shall be appointed for terms of 5 years each, except that any individual chosen to fill a vacancy shall be appointed only for the unexpired term of the member whom he shall succeed. The President shall designate one member to serve as chairman of the Board. Any member of the Board may be removed by the President, upon notice and hearing, for neglect of duty or malfeasance in office, but for no other cause.

(b) A vacancy in the Board shall not impair the right of the remaining members to exercise all the powers of the Board, and two members of the Board shall, at all times, constitute a quorum. The board shall have an official seal which shall be judicially noticed.

(c) The Board shall at the close of each fiscal year make a report in writing to Congress and to the President stating in detail the cases it has heard, the decisions it has rendered, the names, salaries, and duties of all employees and officers in the employ or under the supervision of the Board, and an account of all moneys it has disbursed.

Sec. 4. *Personnel of Board.*—(a) Each member of the Board shall receive a salary of \$10,000 a year, shall be eligible for reappointment, and shall not engage in any other business, vocation, or employment. The Board shall appoint, without regard for the provisions of the civil-service laws but subject to the Classification Act of 1923, as amended, an executive secretary, and such attorneys, examiners, and regional directors, and shall appoint such other employees with regard to existing laws applicable to the employment and compensation of officers and employees of the United States, as it may from time to time find necessary for the proper performance of its duties and as may be from time to time appropriated for by Congress. The Board may establish or utilize such regional, local, or other agencies, and utilize such voluntary and uncompensated services, as may from time to time be needed. Attorneys appointed under this section may, at the direction of the Board, appear for and represent the Board in any case in court. Nothing in this act shall be construed to authorize the Board to appoint individuals for the purpose of conciliation or mediation (or for statistical work),

where such service may be obtained from the Department of Labor.

(b) Upon the appointment of the three original members of the Board and the designation of its chairman, the old Board shall cease to exist. All employees of the old Board shall be transferred to and become employees of the Board with salaries under the Classification Act of 1923, as amended, without acquiring by such transfer a permanent or civil-service status. All records, papers, and property of the old Board shall become records, papers, and property of the Board, and all unexpended funds and appropriations for the use and maintenance of the old Board shall become funds and appropriations available to be expended by the Board in the exercise of the powers, authority, and duties conferred on it by this act.

(c) All of the expenses of the Board, including all necessary traveling and subsistence expenses outside the District of Columbia incurred by the members or employees of the Board under its orders, shall be allowed and paid on the presentation of itemized vouchers therefor approved by the Board or by any individual it designates for that purpose.

Sec. 5. *Location of Board.*—The principal office of the Board shall be in the District of Columbia, but it may meet and exercise any or all of its powers at any other place. The Board may, by one or more of its members or by such agents or agencies as it may designate, prosecute any inquiry necessary to its functions in any part of the United States. A member who participates in such an inquiry shall not be disqualified from subsequently participating in a decision of the Board in the same case.

Sec. 6. *Powers of Board.*—(a) The Board shall have authority from time to time to make, amend, and rescind such rules and regulations as may be necessary to carry out the provisions of this act. Such rules and regulations shall be effective upon publication in the manner which the Board shall prescribe.

Sec. 7. *Rights of employees.*—Employees shall have the right to self-organization, to form, join, or assist labor organizations, to bargain collectively through representatives of their own choosing, and to engage in concerted activities, for the purpose of collective bargaining or other mutual aid or protection.

Sec. 8. *Unfair labor practices.*—It shall be an unfair labor practice for an employer—

(1) To interfere with, restrain, or coerce employees in the exercise of the rights guaranteed in section 7.

(2) To dominate or interfere with the formation or administration of any labor organization or contribute financial or other support to it: *Provided*, That subject to rules and regulations made and published by the Board pursuant to section 6 (a), an employer shall not be prohibited from permitting employees to confer with him during working hours without loss of time or pay.

(3) By discrimination in regard to hire or tenure of employment or any term or condition of employment to encourage or discourage membership in any labor organization: *Provided*, That nothing in this act,

or in the National Industrial Recovery Act (U. S. C., Supp. VII, title 15, secs. 701-712), as amended from time to time, or in any code or agreement approved, or prescribed thereunder, or in any other statute of the United States, shall preclude an employer from making an agreement with a labor organization (not established, maintained, or assisted by any action defined in this act as an unfair labor practice) to require as a condition of employment membership therein, if such labor organization is the representative of the employees as provided in section 9 (a), in the appropriate collective-bargaining unit covered by such agreement when made.

(4) To discharge or otherwise discriminate against an employee because he has filed charges or given testimony under this act.

(5) To refuse to bargain collectively with the representatives of his employees, subject to the provisions of section 9 (a).

Sec. 9. *Representatives and elections.*—(a) Representatives designated or selected for the purposes of collective bargaining by the majority of the employees in a unit appropriate for such purposes, shall be the exclusive representatives of all the employees in such unit for the purposes of collective bargaining in respect to rates of pay, wages, hours of employment, or other conditions of employment: *Provided*, That any individual employee or a group of employees shall have the right at any time to present grievances to their employer.

(b) The Board shall decide in each case whether, in order to insure to employees the full benefit of their right to self-organization and to collective bargaining, and otherwise to effectuate the policies of this act, the unit appropriate for the purposes of collective bargaining shall be the employer unit, craft unit, plant unit, or subdivision thereof.

(c) Whenever a question affecting commerce arises concerning the representation of employees, the Board may investigate such controversy and certify to the parties, in writing, the name or names of the representatives that have been designated or selected. In any such investigation, the Board shall provide for an appropriate hearing upon due notice, either in conjunction with a proceeding under section 10 or otherwise, and may take a secret ballot of employees, or utilize any other suitable method to ascertain such representatives.

(d) Whenever an order of the Board made pursuant to section 10 (c) is based in whole or in part upon facts certified following an investigation pursuant to subsection (c) of this section, and there is a petition for the enforcement or review of such order, such certification and the record of such investigation shall be included in the transcript of the entire record required to be filed under subsections 10 (e) or 10 (f), and thereupon the decree of the court enforcing, modifying, or setting aside in whole or in part the order of the Board shall be made and entered upon the pleadings, testimony, and proceedings set forth in such transcript.

Sec. 10. *Prevention of unfair labor practices.*—(a) The Board is empowered, as hereinafter provided, to prevent any person from engaging in any unfair labor practice (listed in section 8) affecting commerce.

This power shall be exclusive, and shall not be affected by any other means of adjustment or prevention that has been or may be established by agreement, code, law, or otherwise.

(b) Whenever it is charged that any person has engaged in or is engaging in any such unfair labor practice, the Board, or any agent or agency designated by the Board for such purposes, shall have power to issue and cause to be served upon such person a complaint stating the charges in that respect, and containing a notice of hearing before the Board or member thereof, or before a designated agent or agency, at a place therein fixed, not less than 5 days after the serving of said complaint. Any such complaint may be amended by the member, agent or agency conducting the hearing, or the Board in its discretion at any time prior to the issuance of an order based thereon. The person so complained of shall have the right to file an answer to the original or amended complaint and to appear in person or otherwise and give testimony at the place and time fixed in the complaint. In the discretion of the member, agent or agency conducting the hearing, or the Board, any other person may be allowed to intervene in the said proceeding and to present testimony. In any such proceeding the rules of evidence prevailing in courts of law or equity shall not be controlling.

(c) The testimony taken by such member, agent or agency, or the Board shall be reduced to writing and filed with the Board. Thereafter, in its discretion, the Board upon notice may take further testimony or hear argument. If upon all the testimony taken, the Board shall be of the opinion that any person named in the complaint has engaged in or is engaging in any such unfair labor practice, then the Board shall state its findings of fact and shall issue and cause to be served on such person an order requiring such person to cease and desist from such unfair labor practice, and to take such affirmative action, including reinstatement of employees with or without back pay, as will effectuate the policies of this act. Such order may further require such person to make reports from time to time showing the extent to which it has complied with the order. If upon all the testimony taken, the Board shall be of the opinion that no person named in the complaint has engaged in or is engaging in any such unfair labor practice, then the Board shall state its findings of fact and shall issue an order dismissing the said complaint.

(d) Until a transcript of the record in a case shall have been filed in a court, as hereinafter provided, the Board may at any time, upon reasonable notice and in such manner as it shall deem proper, modify or set aside, in whole or in part, any finding or order made or issued by it.

(e) The Board shall have power to petition any circuit court of appeals of the United States (including the Court of Appeals of the District of Columbia), or if all the circuit courts of appeals to which application may be made are in vacation, any district court of the United States (including the Supreme Court of the District of Columbia), within any circuit or district, respectively, wherein the unfair labor practice in question occurred or wherein such person resides or transacts business, for the enforcement of such order and for appropriate temporary

relief or restraining order, and shall certify and file in the court a transcript of the entire record in the proceeding, including the pleadings and testimony upon which such order was entered and the findings and order of the Board. Upon such filing, the court shall cause notice thereof to be served upon such person, and thereupon shall have jurisdiction of the proceeding and of the question determined therein, and shall have power to grant such temporary relief or restraining order as it deems just and proper, and to make and enter upon the pleadings, testimony, and proceedings set forth in such transcript a decree enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part the order of the Board. No objection that has not been urged before the Board, its member, agent, or agency, shall be considered by the court, unless the failure or neglect to urge such objection shall be excused because of extraordinary circumstances. The findings of the Board as to the facts, if supported by evidence, shall be conclusive. If either party shall apply to the court for leave to adduce additional evidence and shall show to the satisfaction of the court that such additional evidence is material and that there were reasonable grounds for the failure to adduce such evidence in the hearing before the Board, its member, agent, or agency, the court may order such additional evidence to be taken before the Board, its member, agent, or agency, and to be made a part of the transcript. The Board may modify its findings as to the facts, or make new findings, by reason of additional evidence so taken and filed, and it shall file such modified or new findings, which, if supported by evidence, shall be conclusive, and shall file its recommendations, if any, for the modification or setting aside of its original order. The jurisdiction of the court shall be exclusive and its judgment and decree shall be final, except that the same shall be subject to review by the appropriate circuit court of appeals if application was made to the district court as hereinabove provided, and by the Supreme Court of the United States upon writ of certiorari or certification as provided in sections 239 and 240 of the Judicial Code, as amended (U.S.C., title 28, secs. 346 and 347).

(f) Any person aggrieved by a final order of the Board granting or denying in whole or in part the relief sought may obtain a review of such order in any circuit court of appeals of the United States in the circuit wherein the unfair labor practice in question was alleged to have been engaged in or wherein such person resides or transacts business, or in the Court of Appeals of the District of Columbia, by filing in such court a written petition praying that the order of the Board be modified or set aside. A copy of such petition shall be forthwith served upon the Board, and thereupon the aggrieved party shall file in the court a transcript of the entire record in the proceeding, certified by the Board, including the pleading and testimony upon which the order complained of was entered and the findings and order of the Board. Upon such filing, the court shall proceed in the same manner as in the case of an application by the Board under subsection (e), and shall have the same exclusive jurisdiction to grant to the Board such temporary relief or restraining

order as it deems just and proper, and in like manner to make and enter a decree enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part the order of the Board; and the findings of the Board as to the facts, if supported by evidence, shall in like manner be conclusive.

(g) The commencement of proceedings under subsection (e) or (f) of this section shall not, unless specifically ordered by the court, operate as a stay of the Board's order.

(h) When granting appropriate temporary relief or a restraining order, or making and entering a decree enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part an order of the Board, as provided in this section, the jurisdiction of courts sitting in equity shall not be limited by the act entitled "An act to amend the Judicial Code and to define and limit the jurisdiction of courts sitting in equity, and for other purposes", approved March 23, 1932 (U. S. C., Supp. VII, title 29, secs. 101-115).

(i) Petitions filed under this act shall be heard expeditiously and, if possible, within 10 days after they have been docketed.

Sec. 11. *Investigatory powers.*—For the purpose of all hearings and investigations, which, in the opinion of the Board, are necessary and proper for the exercise of the powers vested in it by section 9 and section 10—

(1) The Board, or its duly authorized agents or agencies, shall at all reasonable times have access to, for the purpose of examination, and the right to copy any evidence of any person being investigated or proceeded against that relates to any matter under investigation or in question. Any member of the Board shall have power to issue subpoenas requiring the attendance and testimony of witnesses and the production of any evidence that relates to any matter under investigation or in question, before the Board, its member, agent, or agency conducting the hearing or investigation. Any member of the Board, or any agent or agency designated by the Board for such purposes, may administer oaths and affirmations, examine witnesses, and receive evidence. Such attendance of witnesses and the production of such evidence may be required from any place in the United States or any Territory or possession thereof, at any designated place of hearing.

(2) In case of contumacy or refusal to obey a subpoena issued to any person, any District Court of the United States or the United States courts of any Territory or possession, or the Supreme Court of the District of Columbia, within the jurisdiction of which the inquiry is carried on or within the jurisdiction of which said person guilty of contumacy or refusal to obey is found or resides or transacts business, upon application by the Board shall have jurisdiction to issue to such person an order requiring such person to appear before the Board, its member, agent, or agency, there to produce evidence if so ordered, or there to give testimony touching the matter under investigation or in question; and any failure to obey such order of the court may be punished by said court as a contempt thereof.

(3) No person shall be excused from attending and testifying or from producing books, records, correspondence, documents, or other evidence in obedience to the subpoena of the Board, on the ground that the testimony or evidence required of him may tend to incriminate him or subject him to a penalty or forfeiture; but no individual shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter, or thing concerning which he is compelled, after having claimed his privilege against self-incrimination, to testify or produce evidence, except that such individual so testifying shall not be exempt from prosecution and punishment for perjury committed in so testifying.

(4) Complaints, orders, and other process and papers of the Board, its member, agent, or agency, may be served either personally or by registered mail or by telegraph or by leaving a copy thereof at the principal office or place of business of the person required to be served. The verified return by the individual so serving the same setting forth the manner of such service shall be proof of the same, and the return post-office receipt or telegraph receipt therefor when registered and mailed or telegraphed as aforesaid shall be proof of service of the same. Witnesses summoned before the Board, its member, agent, or agency, shall be paid the same fees and mileage that are paid witnesses in the courts of the United States, and witnesses whose depositions are taken and the persons taking the same shall severally be entitled to the same fees as are paid for like services in the courts of the United States.

(5) All process of any court to which application may be made under this act may be served in the judicial district wherein the defendant or other person required to be served resides or may be found.

(6) The several departments and agencies of the Government, when directed by the President, shall furnish the Board, upon its request, all records, papers, and information in their possession relating to any matter before the Board.

Sec. 12. *Violations.*—Any person who shall willfully resist, prevent, impede, or interfere with any member of the Board or any of its agents or agencies in the performance of duties pursuant to this act shall be punished by a fine of not more than \$5,000 or by imprisonment for not more than 1 year, or both.

Sec. 13. *Right to strike preserved.*—Nothing in this act shall be construed so as to interfere with or impede or diminish in any way the right to strike.

Sec. 14. *Conflicting laws.*—Wherever the application of the provisions of section 7 (a) of the National Industrial Recovery Act (U. S. C., Supp. VII, title 15, sec. 707 (a)), as amended from time to time, or of section 77 B, paragraphs (l) and (m) of the act approved June 7, 1934, entitled "An act to amend an act entitled 'An act to establish a uniform system of bankruptcy throughout the United States' approved July 1, 1898, and acts amendatory thereof and supplementary thereto" (48 Stat. 922, pars. (l) and (m)), as amended from time to time, or of Public Resolution No. 44, approved June 19, 1934 (48 Stat. 1183), conflicts with the application of the provisions of this act, this act shall prevail: *Pro-*

vided, That in any situation where the provisions of this act cannot be validly enforced, the provisions of such other acts shall remain in full force and effect.

SEC. 15. *Constitutionality*.—If any provision of this act, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this act, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

SEC. 16. *Title of act*.—This act may be cited as the "National Labor Relations Act."

APPENDIX E

VALUES OF x AND A FOR BI-SERIAL ETA

(The table represents the cumulative area, A , of the right half of the normal curve of distribution of unit area. Values of x are measured in standard deviation units.)

x	A	x	A	x	A
0.00	0.00000	0.50	0.19146	1.00	0.34134
0.01	0.00399	0.51	0.19497	1.01	0.34375
0.02	0.00798	0.52	0.19847	1.02	0.34614
0.03	0.01197	0.53	0.20194	1.03	0.34850
0.04	0.01595	0.54	0.20540	1.04	0.35083
0.05	0.01994	0.55	0.20884	1.05	0.35314
0.06	0.02392	0.56	0.21228	1.06	0.35543
0.07	0.02790	0.57	0.21566	1.07	0.35769
0.08	0.03188	0.58	0.21904	1.08	0.35993
0.09	0.03586	0.59	0.22240	1.09	0.36214
0.10	0.03983	0.60	0.22575	1.10	0.36433
0.11	0.04380	0.61	0.22907	1.11	0.36650
0.12	0.04776	0.62	0.23237	1.12	0.36864
0.13	0.05172	0.63	0.23565	1.13	0.37076
0.14	0.05567	0.64	0.23891	1.14	0.37286
0.15	0.05962	0.65	0.24215	1.15	0.37493
0.16	0.06356	0.66	0.24537	1.16	0.37698
0.17	0.06749	0.67	0.24857	1.17	0.37900
0.18	0.07142	0.68	0.25175	1.18	0.38100
0.19	0.07535	0.69	0.25490	1.19	0.38298
0.20	0.07928	0.70	0.25804	1.20	0.38493
0.21	0.08317	0.71	0.26115	1.21	0.38686
0.22	0.08706	0.72	0.26424	1.22	0.38877
0.23	0.09095	0.73	0.26730	1.23	0.39065
0.24	0.09483	0.74	0.27035	1.24	0.39251
0.25	0.09871	0.75	0.27337	1.25	0.39435
0.26	0.10257	0.76	0.27637	1.26	0.39617
0.27	0.10642	0.77	0.27935	1.27	0.39796
0.28	0.11026	0.78	0.28230	1.28	0.39973
0.29	0.11409	0.79	0.28524	1.29	0.40147
0.30	0.11791	0.80	0.28814	1.30	0.40320
0.31	0.12172	0.81	0.29103	1.31	0.40490
0.32	0.12552	0.82	0.29389	1.32	0.40658
0.33	0.12930	0.83	0.29673	1.33	0.40824
0.34	0.13307	0.84	0.29955	1.34	0.40988
0.35	0.13683	0.85	0.30234	1.35	0.41149
0.36	0.14058	0.86	0.30511	1.36	0.41309
0.37	0.14431	0.87	0.30785	1.37	0.41466
0.38	0.14803	0.88	0.31057	1.38	0.41621
0.39	0.15173	0.89	0.31327	1.39	0.41774
0.40	0.15542	0.90	0.31594	1.40	0.41924
0.41	0.15910	0.91	0.31859	1.41	0.42073
0.42	0.16276	0.92	0.32121	1.42	0.42220
0.43	0.16640	0.93	0.32381	1.43	0.42364
0.44	0.17003	0.94	0.32639	1.44	0.42507
0.45	0.17364	0.95	0.32894	1.45	0.42647
0.46	0.17724	0.96	0.33147	1.46	0.42786
0.47	0.18082	0.97	0.33398	1.47	0.42922
0.48	0.18439	0.98	0.33646	1.48	0.43056
0.49	0.18793	0.99	0.33891	1.49	0.43189

x	A	x	A	x	A
1.50	0.43319	2.00	0.47725	2.50	0.49379
1.51	0.43448	2.01	0.47778	2.51	0.49396
1.52	0.43574	2.02	0.47831	2.52	0.49413
1.53	0.43699	2.03	0.47882	2.53	0.49430
1.54	0.43822	2.04	0.47932	2.54	0.49446
1.55	0.43943	2.05	0.47982	2.55	0.49461
1.56	0.44062	2.06	0.48030	2.56	0.49477
1.57	0.44179	2.07	0.48077	2.57	0.49492
1.58	0.44295	2.08	0.48124	2.58	0.49506
1.59	0.44408	2.09	0.48169	2.59	0.49520
1.60	0.44520	2.10	0.48214	2.60	0.49534
1.61	0.44630	2.11	0.48257	2.61	0.49547
1.62	0.44738	2.12	0.48300	2.62	0.49560
1.63	0.44845	2.13	0.48341	2.63	0.49573
1.64	0.44950	2.14	0.48382	2.64	0.49585
1.65	0.45053	2.15	0.48422	2.65	0.49598
1.66	0.45154	2.16	0.48461	2.66	0.49609
1.67	0.45254	2.17	0.48500	2.67	0.49621
1.68	0.45352	2.18	0.48537	2.68	0.49632
1.69	0.45449	2.19	0.48574	2.69	0.49643
1.70	0.45543	2.20	0.48610	2.70	0.49653
1.71	0.45637	2.21	0.48645	2.71	0.49664
1.72	0.45728	2.22	0.48679	2.72	0.49674
1.73	0.45818	2.23	0.48713	2.73	0.49683
1.74	0.45907	2.24	0.48745	2.74	0.49693
1.75	0.45994	2.25	0.48778	2.75	0.49702
1.76	0.46080	2.26	0.48809	2.76	0.49711
1.77	0.46164	2.27	0.48840	2.77	0.49720
1.78	0.46246	2.28	0.48870	2.78	0.49728
1.79	0.46327	2.29	0.48899	2.79	0.49736
1.80	0.46407	2.30	0.48928	2.80	0.49744
1.81	0.46485	2.31	0.48956	2.81	0.49752
1.82	0.46562	2.32	0.48983	2.82	0.49760
1.83	0.46638	2.33	0.49010	2.83	0.49767
1.84	0.46712	2.34	0.49036	2.84	0.49774
1.85	0.46784	2.35	0.49061	2.85	0.49781
1.86	0.46856	2.36	0.49086	2.86	0.49788
1.87	0.46926	2.37	0.49111	2.87	0.49795
1.88	0.46995	2.38	0.49134	2.88	0.49801
1.89	0.47062	2.39	0.49158	2.89	0.49807
1.90	0.47128	2.40	0.49180	2.90	0.49813
1.91	0.47193	2.41	0.49202	2.91	0.49819
1.92	0.47257	2.42	0.49224	2.92	0.49825
1.93	0.47320	2.43	0.49245	2.93	0.49831
1.94	0.47381	2.44	0.49266	2.94	0.49836
1.95	0.47441	2.45	0.49286	2.95	0.49841
1.96	0.47500	2.46	0.49305	2.96	0.49846
1.97	0.47558	2.47	0.49324	2.97	0.49851
1.98	0.47615	2.48	0.49343	2.98	0.49856
1.99	0.47670	2.49	0.49361	2.99	0.49861

Appendix E

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<i>x</i>	<i>A</i>	<i>x</i>	<i>A</i>	<i>x</i>	<i>A</i>
3.00	0.49865	3.40	0.49966	3.80	0.49993
3.01	0.49869	3.41	0.49968	3.81	0.49993
3.02	0.49874	3.42	0.49969	3.82	0.49993
3.03	0.49878	3.43	0.49970	3.83	0.49994
3.04	0.49882	3.44	0.49971	3.84	0.49994
3.05	0.49886	3.45	0.49972	3.85	0.49994
3.06	0.49889	3.46	0.49973	3.86	0.49994
3.07	0.49893	3.47	0.49974	3.87	0.49995
3.08	0.49897	3.48	0.49975	3.88	0.49995
3.09	0.49900	3.49	0.49976	3.90	0.49995
3.10	0.49903	3.50	0.49977	3.91	0.49995
3.11	0.49906	3.51	0.49978	3.92	0.49996
3.12	0.49910	3.52	0.49978	3.94	0.49996
3.13	0.49913	3.53	0.49979	3.95	0.49996
3.14	0.49916	3.54	0.49980	3.97	0.49996
3.15	0.49918	3.55	0.49981	3.98	0.49997
3.16	0.49921	3.56	0.49981	4.00	0.49997
3.17	0.49924	3.57	0.49982	4.02	0.49997
3.18	0.49926	3.58	0.49983	4.04	0.49997
3.19	0.49929	3.59	0.49983	4.07	0.49998
3.20	0.49931	3.60	0.49984		
3.21	0.49934	3.61	0.49985		
3.22	0.49936	3.62	0.49985		
3.23	0.49938	3.63	0.49986		
3.24	0.49940	3.64	0.49986		
3.25	0.49942	3.65	0.49987		
3.26	0.49944	3.66	0.49987		
3.27	0.49946	3.67	0.49988		
3.28	0.49948	3.68	0.49988		
3.29	0.49950	3.69	0.49989		
3.30	0.49952	3.70	0.49989		
3.31	0.49953	3.71	0.49990		
3.32	0.49955	3.72	0.49990		
3.33	0.49957	3.73	0.49990		
3.34	0.49958	3.74	0.49991		
3.35	0.49960	3.75	0.49991		
3.36	0.49961	3.76	0.49992		
3.37	0.49962	3.77	0.49992		
3.38	0.49964	3.78	0.49992		
3.39	0.49965	3.79	0.49992		

APPENDIX F

VALUES OF z FOR BI-SERIAL CORRELATION ¹

q	z	q	z	q	z
.500	.3989	.450	.3958	.400	.3863
.499	.3989	.449	.3957	.399	.3861
.498	.3989	.448	.3955	.398	.3858
.497	.3989	.447	.3954	.397	.3856
.496	.3989	.446	.3953	.396	.3853
.495	.3989	.445	.3951	.395	.3850
.494	.3989	.444	.3950	.394	.3848
.493	.3989	.443	.3949	.393	.3845
.492	.3989	.442	.3947	.392	.3842
.491	.3988	.441	.3946	.391	.3840
.490	.3988	.440	.3944	.390	.3837
.489	.3988	.439	.3943	.389	.3834
.488	.3988	.438	.3941	.388	.3831
.487	.3987	.437	.3940	.387	.3828
.486	.3987	.436	.3938	.386	.3825
.485	.3987	.435	.3936	.385	.3823
.484	.3986	.434	.3935	.384	.3820
.483	.3986	.433	.3933	.383	.3817
.482	.3985	.432	.3931	.382	.3814
.481	.3985	.431	.3930	.381	.3811
.480	.3984	.430	.3928	.380	.3808
.479	.3984	.429	.3926	.379	.3804
.478	.3983	.428	.3924	.378	.3801
.477	.3983	.427	.3922	.377	.3798
.476	.3982	.426	.3921	.376	.3795
.475	.3982	.425	.3919	.375	.3792
.474	.3981	.424	.3917	.374	.3789
.473	.3980	.423	.3915	.373	.3786
.472	.3980	.422	.3913	.372	.3782
.471	.3979	.421	.3911	.371	.3779
.470	.3978	.420	.3909	.370	.3776
.469	.3977	.419	.3907	.369	.3772
.468	.3977	.418	.3905	.368	.3769
.467	.3976	.417	.3903	.367	.3766
.466	.3975	.416	.3901	.366	.3762
.465	.3974	.415	.3899	.365	.3759
.464	.3973	.414	.3896	.364	.3755
.463	.3972	.413	.3894	.363	.3752
.462	.3971	.412	.3892	.362	.3748
.461	.3970	.411	.3890	.361	.3745
.460	.3969	.410	.3887	.360	.3741
.459	.3968	.409	.3885	.359	.3738
.458	.3967	.408	.3883	.358	.3734
.457	.3966	.407	.3881	.357	.3730
.456	.3965	.406	.3878	.356	.3727
.455	.3964	.405	.3876	.355	.3723
.454	.3963	.404	.3873	.354	.3719
.453	.3962	.403	.3871	.353	.3719
.452	.3961	.402	.3868	.352	.3712
.451	.3959	.401	.3866	.351	.3708

¹ Adopted by permission from Enlow, Elmer R., *Statistics in Education and Psychology*, p. 165. New York: Prentice-Hall, Inc., 1937.

Appendix F

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<i>q</i>	<i>z</i>	<i>q</i>	<i>z</i>	<i>q</i>	<i>z</i>
.350	.3704	.300	.3477	.250	.3178
.349	.3700	.299	.3472	.249	.3171
.348	.3696	.298	.3466	.248	.3164
.347	.3692	.297	.3461	.247	.3157
.346	.3688	.296	.3456	.246	.3151
.345	.3684	.295	.3450	.245	.3144
.344	.3680	.294	.3445	.244	.3137
.343	.3676	.293	.3440	.243	.3130
.342	.3672	.292	.3434	.242	.3123
.341	.3668	.291	.3429	.241	.3116
.340	.3664	.290	.3423	.240	.3109
.339	.3660	.289	.3417	.239	.3102
.338	.3656	.288	.3412	.238	.3095
.337	.3652	.287	.3406	.237	.3087
.336	.3647	.286	.3401	.236	.3080
.335	.3643	.285	.3395	.235	.3073
.334	.3639	.284	.3389	.234	.3066
.333	.3635	.283	.3384	.233	.3059
.332	.3630	.282	.3378	.232	.3051
.331	.3626	.281	.3372	.231	.3044
.330	.3621	.280	.3366	.230	.3036
.329	.3617	.279	.3360	.229	.3029
.328	.3613	.278	.3355	.228	.3022
.327	.3608	.277	.3349	.227	.3014
.326	.3604	.276	.3343	.226	.3007
.325	.3599	.275	.3337	.225	.2999
.324	.3595	.274	.3331	.224	.2992
.323	.3590	.273	.3325	.223	.2984
.322	.3585	.272	.3319	.222	.2976
.321	.3581	.271	.3313	.221	.2969
.320	.3576	.270	.3306	.220	.2961
.319	.3571	.269	.3300	.219	.2953
.318	.3567	.268	.3294	.218	.2945
.317	.3562	.267	.3288	.217	.2938
.316	.3557	.266	.3282	.216	.2930
.315	.3552	.265	.3275	.215	.2922
.314	.3548	.264	.3269	.214	.2914
.313	.3543	.263	.3263	.213	.2906
.312	.3538	.262	.3256	.212	.2898
.311	.3533	.261	.3250	.211	.2890
.310	.3528	.260	.3244	.210	.2882
.309	.3523	.259	.3237	.209	.2874
.308	.3518	.258	.3231	.208	.2866
.307	.3513	.257	.3224	.207	.2858
.306	.3508	.256	.3218	.206	.2849
.305	.3503	.255	.3211	.205	.2841
.304	.3498	.254	.3204	.204	.2833
.303	.3493	.253	.3198	.203	.2825
.302	.3487	.252	.3191	.202	.2816
.301	.3482	.251	.3184	.201	.2808

q	z	q	z	q	z
.200	.2800	.150	.2332	.100	.1755
.199	.2791	.149	.2321	.099	.1742
.198	.2783	.148	.2311	.098	.1729
.197	.2774	.147	.2300	.097	.1716
.196	.2766	.146	.2290	.096	.1703
.195	.2757	.145	.2279	.095	.1690
.194	.2748	.144	.2269	.094	.1677
.193	.2740	.143	.2258	.093	.1664
.192	.2731	.142	.2247	.092	.1651
.191	.2722	.141	.2237	.091	.1637
.190	.2714	.140	.2226	.090	.1624
.189	.2705	.139	.2215	.089	.1610
.188	.2696	.138	.2204	.088	.1597
.187	.2687	.137	.2193	.087	.1583
.186	.2678	.136	.2182	.086	.1570
.185	.2669	.135	.2171	.085	.1556
.184	.2660	.134	.2160	.084	.1542
.183	.2651	.133	.2149	.083	.1529
.182	.2642	.132	.2138	.082	.1515
.181	.2633	.131	.2127	.081	.1501
.180	.2624	.130	.2115	.080	.1487
.179	.2615	.129	.2104	.079	.1473
.178	.2606	.128	.2093	.078	.1458
.177	.2596	.127	.2081	.077	.1444
.176	.2587	.126	.2070	.076	.1430
.175	.2578	.125	.2059	.075	.1416
.174	.2568	.124	.2047	.074	.1401
.173	.2559	.123	.2035	.073	.1387
.172	.2550	.122	.2024	.072	.1372
.171	.2540	.121	.2012	.071	.1357
.170	.2531	.120	.2000	.070	.1343
.169	.2521	.119	.1989	.069	.1328
.168	.2511	.118	.1977	.068	.1313
.167	.2502	.117	.1965	.067	.1298
.166	.2492	.116	.1953	.066	.1283
.165	.2482	.115	.1941	.065	.1268
.164	.2473	.114	.1929	.064	.1253
.163	.2463	.113	.1917	.063	.1238
.162	.2453	.112	.1905	.062	.1222
.161	.2443	.111	.1893	.061	.1207
.160	.2433	.110	.1880	.060	.1191
.159	.2423	.109	.1868	.059	.1176
.158	.2413	.108	.1856	.058	.1160
.157	.2403	.107	.1843	.057	.1144
.156	.2393	.106	.1831	.056	.1128
.155	.2383	.105	.1818	.055	.1112
.154	.2373	.104	.1806	.054	.1096
.153	.2362	.103	.1793	.053	.1080
.152	.2352	.102	.1781	.052	.1064
.151	.2342	.101	.1768	.051	.1048

Appendix F

617

<i>q</i>	<i>s</i>	<i>q</i>	<i>s</i>	<i>q</i>	<i>s</i>
.050	.1031	.030	.0680	.010	.0267
.049	.1015	.029	.0662	.009	.0243
.048	.0998	.028	.0643	.008	.0219
.047	.0982	.027	.0623	.007	.0195
.046	.0965	.026	.0604	.006	.0170
.045	.0948	.025	.0584	.005	.0145
.044	.0931	.024	.0565	.004	.0118
.043	.0914	.023	.0545	.003	.0091
.042	.0897	.022	.0525	.002	.0063
.041	.0879	.021	.0505	.001	.0034
.040	.0862	.020	.0484		
.039	.0844	.019	.0464		
.038	.0826	.018	.0443		
.037	.0809	.017	.0422		
.036	.0791	.016	.0400		
.035	.0773	.015	.0379		
.034	.0755	.014	.0357		
.033	.0736	.013	.0335		
.032	.0718	.012	.0312		
.031	.0699	.011	.0290		

APPENDIX G

THE LEAST SIGNIFICANT (5%) VALUES OF CORRELATION MEASURES ¹

This chart is adapted to the evaluation of both simple and more complicated measures of correlation. To that end, curves are designated according to the number of constants in the regression equation. For simple linear correlation, therefore, the curve $m = 2$ is used, and the same curve may be employed in evaluating bi-serial r and bi-serial η .

The procedure in the use of the chart is as follows: (1) Locate the given number of items, N , on the base line. (2) Note the point at which the ordinate of that number intersects the selected curve. (3) Read the appropriate value on the horizontal scale directly at the left of the point of intersection. For instance, for a simple linear coefficient derived from analysis of 75 cases, the indicated value is approximately 0.23. This value is the least significant for the given conditions; that is, a value as great or greater would appear only once in twenty times by pure chance.

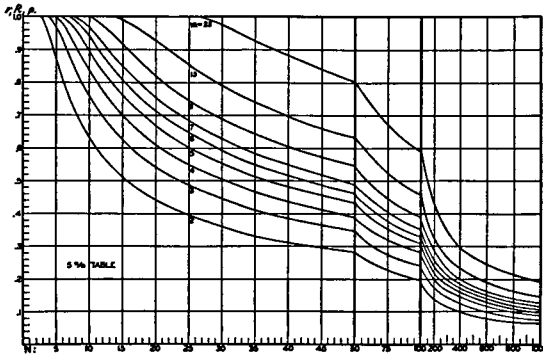


Fig. 37.—Least Significant Measures of Correlation.

¹Reproduced by permission from Davies, G. R., and Yoder, Dale, *Business Statistics*, p. 497. New York: John Wiley & Sons, Inc., 1937.

APPENDIX H

THE LEAST HIGHLY SIGNIFICANT (1%) VALUES OF CORRELATION MEASURES¹

This chart, like Figure 37, is adapted to the evaluation of both simple and more complicated measures of correlation. It is for that reason that a number of curves are included. Each is designated in terms of the number of constants in the regression equation. For simple correlation and for bi-serial r and bi-serial η , the curve, $m = 2$, is used.

The steps in evaluating a given measure are the same as those for Figure 37. The resultant value is that which may be regarded as the least highly significant; that is, a value as great or greater would appear only once in one hundred times by pure chance.

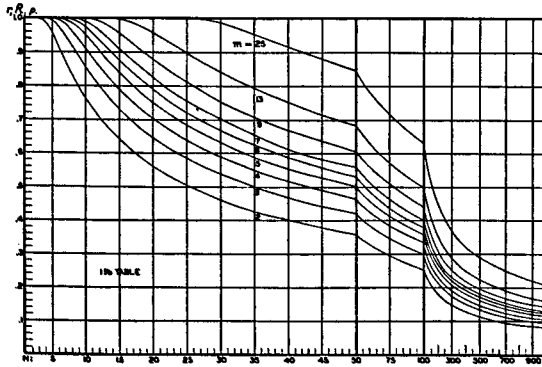


Fig. 38.—Least Highly Significant Measures of Correlation.

¹ Reproduced by permission from Davies, G. R., and Yoder, Dale, *Business Statistics*, p. 498. New York: John Wiley & Sons, Inc., 1937.

APPENDIX I

EVALUATION OF CHI-SQUARE¹

The measure of chi-square is used to determine to what extent a given distribution conforms to the characteristics of a normal or chance distribution having similar characteristics. The chart indicates the degree of probability that a given distribution is merely the result of chance. That probability is expressed in the form of a percentage, and the discovered probability represents, therefore, the number of times in one hundred that the given distribution might be expected to appear by pure chance. If the probability is 5 per cent or less, it may be considered significant; if it is 1 per cent or less, it is conventionally regarded as highly significant.

To use the chart: (1) Locate the given value of chi-square on the base line. (2) Select the appropriate curve, which is that whose number corresponds to the number of classes per row less

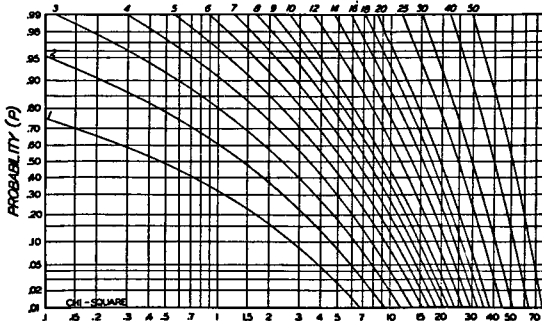


Fig. 39.—Evaluation of Chi-Square.

¹ Reproduced by permission from Davies, G. R., and Yoder, Dale, *Business Statistics*, p. 502. New York: John Wiley & Sons, Inc., 1937.

one multiplied by the number of classes per column less one. Thus, for the ordinary fourfold table, the curve is $(2 - 1) \times (2 - 1) = 1$. For a three by two table, the curve is $(3 - 1) \times (2 - 1) = 2$. (3) Note the point of intersection of the selected curve with the ordinate rising from the given value on the base line. (4) Read the probability on the horizontal scale at the left of the point of intersection. To illustrate, assume a chi-square value of 1.5 from a fourfold table. The curve is that numbered 1. The indicated probability is approximately .22, which means that a value of chi-square as great or greater might appear, under these conditions, 22 times in one hundred by pure chance.

APPENDIX J

CONVERSION SCALE FOR INTELLIGENCE QUOTIENTS¹

This chart may be most effectively utilized if a ruler is held in a horizontal position across the five scales. It thus indicates equivalent intelligence quotients as measured by each of the tests.

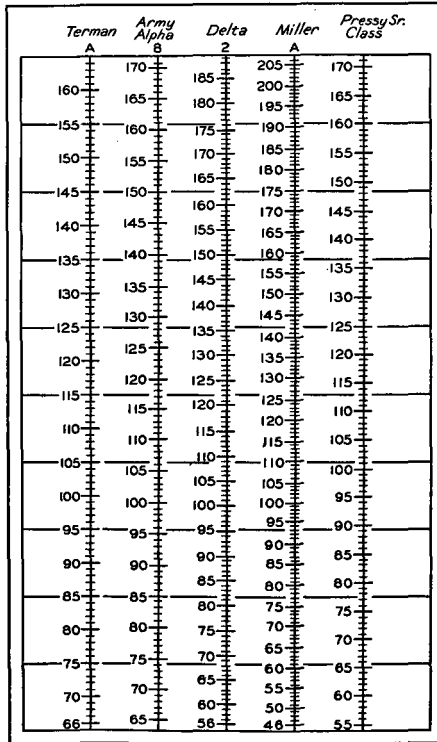


Fig. 40.—Conversion Scale for Intelligence Quotients.

¹ Adapted from Finch, F. A., "Equating Intelligence Quotients from Group Tests," *Journal of Educational Research*, December, 1935, Vol. 28, pp. 589-592.

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